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Our mission at University of Michigan Undergraduate Research Journal is to give students the opportunity to present and publish their research. We work with faculty members at the University of Michigan to review submissions to our journal and work with authors to present their research at the highest quality.

It is our pleasure to assemble another edition of our annual issue that exhibits research from life sciences, social sciences, math, physics, and humanities. The journal is proud of its interdisciplinary identity that represents the diverse academic exploration taking place on our campus.

Sincerely,

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CONFRONTING TWO CRISES: THE EFFECT OF MENTAL HEALTH DISORDERS ON OPIOID USE

ISABEL ZHANG

Previous studies have shown an overlap between opioid misuse and mental health. One theory that explains the relationship between mental health and opioid addiction is that people with depression and other mental health conditions may self-medicate with opioids to alleviate their symptoms. To address this question, I used data from the 2020 National Health Interview Survey to examine the effect of anxiety and depression on opioid use in the past year. I used logistic regression models with estimated odds ratios and controlled for race, sex, and age. Overall, I found that depression level, anxiety level, anxiety frequency, and taking medication for anxiety significantly affected opioid use in the past twelve months. As expected, higher levels of anxiety and depression correlated with increased opioid medication use. However, the correlation between anxiety and depression indicates that respondents who took medication for depression and anxiety were more likely to have used opioids in the past year. This result thus contradicts the hypothesis that people with depression and other mental health conditions may inappropriately self-medicate with opioids to alleviate their symptoms.

Key words

public health, opioids, mental health, health policy

Introduction

The United States is in an opioid crisis that has worsened since the onset of the Coronavirus. Drug overdose deaths reached a record high of 93,331 in 2020. In 2015, opioids were involved in only 18 percent of all overdose deaths; in 2020, over 60 percent of deaths were at least partially attributable to synthetic

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opioid use.¹ The pandemic may have exacerbated the opioid epidemic by worsening mental health. Stressful features of the pandemic —such as the loss of jobs, limited social interactions, and anxiety about contracting COVID— have negatively impacted mental health and created new barriers for people already suffering from mental illness and substance use disorders. Indeed, during the pandemic, about four in ten adults in the U.S. have reported symptoms of anxiety or depressive disorder, up from one in ten adults who reported these symptoms in 2019.²

Previous studies have shown an overlap between opioid use and mental illness. For example, Davis et al. found that people who have a mental health condition, such as depression or anxiety, are more likely to get opioid prescriptions and are at a greater risk of misusing opioids. The study also found that adults in the United States who have a mental health condition receive more than half of all opioid prescriptions, even though they comprise only sixteen percent of the population.³ Moreover, compared with people without depression, participants with severe depression are 14.66 times more likely to misuse opioids.⁴

The widespread misuse of and addiction to opioids has profound implications. The estimated economic loss from opioid abuse in the United States is \$78.5 billion a year, including healthcare costs, lost productivity, addiction treatment, and criminal justice involvement.⁵ Yet despite increases in the prevalence of mental health disorders and opioid misuse, the relationship between these two national crises has not been thoroughly researched.

Researchers have developed multiple theories to explain the relationship between mental health and opioid addiction. This paper focuses on the theory that people with depression and other mental health conditions may self-medicate with opioids to alleviate their symptoms. Specifically, I am interested in whether the severity of mental illness and medication treatment for these disorders impacts opioid use. To address this question, I used data from the 2020 National Health Interview Survey to examine the effect of anxiety and

1. Jesse C. Baumgartner and David Radley, "The Drug Overdose Toll in 2020 and Near-Term Actions for Addressing It," Commonwealth Fund, last modified August 16, 2021, <https://www.commonwealthfund.org/blog/2021/drug-overdose-toll-2020-and-near-term-actions-addressing-it>.

2. Kaiser Family Foundation, last modified February 10, 2021, <https://www.kff.org/coronavirus-covid-19/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/>.

3. Matthew Davis et al., "Prescription Opioid Use among Adults with Mental Health Disorders in the United States," *JABFM*, 1, <https://www.jabfm.org/content/30/4/407>.

4. Daniel Feingold, Silviu Brill, and Itay Goor-Aryeh, "The Association Between Severity of Depression and Prescription Opioid Misuse among Chronic Pain Patients with and without Anxiety: A cross-sectional study" [1], *National Library of Medicine*, 1, <https://pubmed.ncbi.nlm.nih.gov/29660645/>.

5. National Institutes of Health, "Opioid Overdose Crisis," National Institute on Drug Abuse, <https://www.drugabuse.gov/drug-topics/opioids/opioid-overdose-crisis>.

depression on opioid use. I chose to focus on anxiety and depression, as these are the predominant mental health disorders among adults in the United States. My hypothesis that people with depression and anxiety would be associated with opioid use, but that this association would be weaker for people who take medication for their depression/anxiety. Indeed, the results showed that depression level, anxiety level, and medication use for anxiety and depression significantly affected opioid use in the past twelve months, suggesting a crucial overlap between these two national crises.

Methods

This study used data from the 2020 National Health Interview Survey (NHIS), a cross-sectional household interview survey of the United States civilian non-institutionalized population. This survey uses geographically clustered sampling techniques to select a nationally representative sample. It collects data on a broad range of health topics, including substance use and mental health care. People excluded from the interview are those with no fixed household address, people in long-term care institutions, active-duty military personnel, people in correctional facilities, and citizens living in foreign countries. Due to the pandemic, the NHIS shifted from in-person to telephone interviewing starting in late March.⁶

The dependent variable of interest in this paper was opioid use in the past twelve months. The independent variables were depression level, anxiety level, medication use for anxiety, and medication use for depression. I used logistic regression models with estimated odds ratios to test the correlation between the independent variables and opioid use. I chose a significance level of 0.05 and controlled for race, sex, and age. I used the statistical computing package R in all regressions and statistical analyses.

Results

All four variables—depression level, taking medication to treat depression, anxiety level, and taking medication to treat anxiety—had a statistically significant effect on opioid use in the past twelve months. Relative to respondents who reported feeling “a little” depressed, respondents who said they had “a lot” of depression were more likely to have used opioids within the past year by a factor of 1.609 ($p < 0.001$). As shown in figure one, respondents who reported feeling a

6. Centers for Disease Control and Prevention, “About the National Health Interview Survey,” National Center for Health Statistics, https://www.cdc.gov/nchs/nhis/about_nhis.htm.

Variable	Estimate (Odds Ratio)	Standard Error	z value	p > [z]
Depression Level: A Lot	1.609037	0.076581	6.211	1.37E-07
Does Not Take Medication for Depression	-0.8469421	0.062508	-2.658	0.00787
Anxiety Level: A Lot	1.070889	0.068489	5.71	1.13E-08
Does Not Take Medication for Anxiety	-0.178333	0.057802	-3.391	0.000697

Table 1: Effect of Depression and Anxiety on Opioid Use in the Past 12 Months

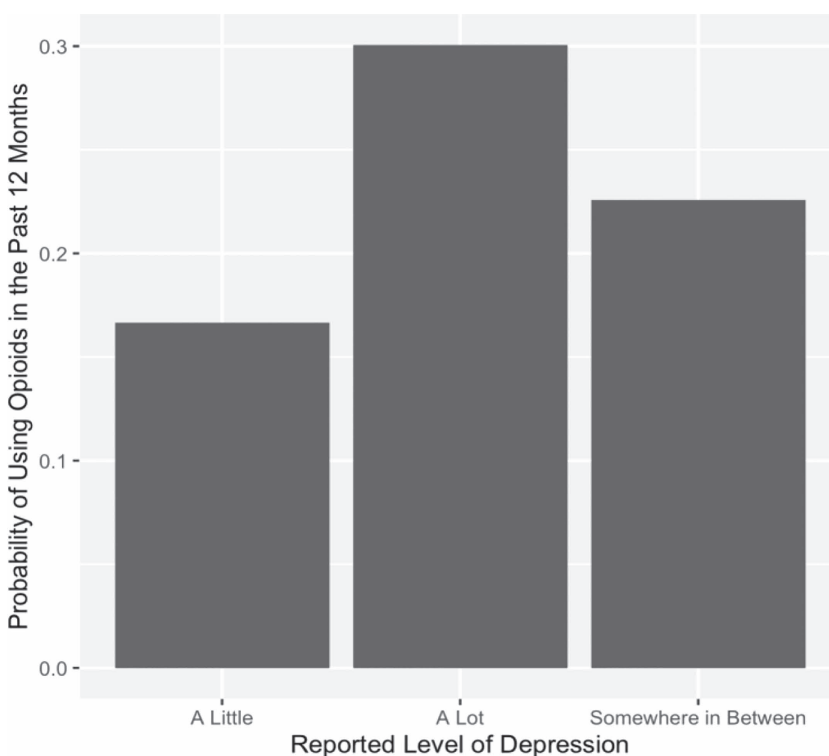


Figure 1: The Effect of Depression Level on the Probability of Using Opioids in the Past Year

little depressed had a 16.7% probability of using opioids, while participants who reported feeling a lot of depression had a 30.4% probability of using opioids. Similarly, respondents who reported feeling “a lot” of anxiety were more likely to have used opioids in the past year by a factor of 1.071 ($p = 0.008$).

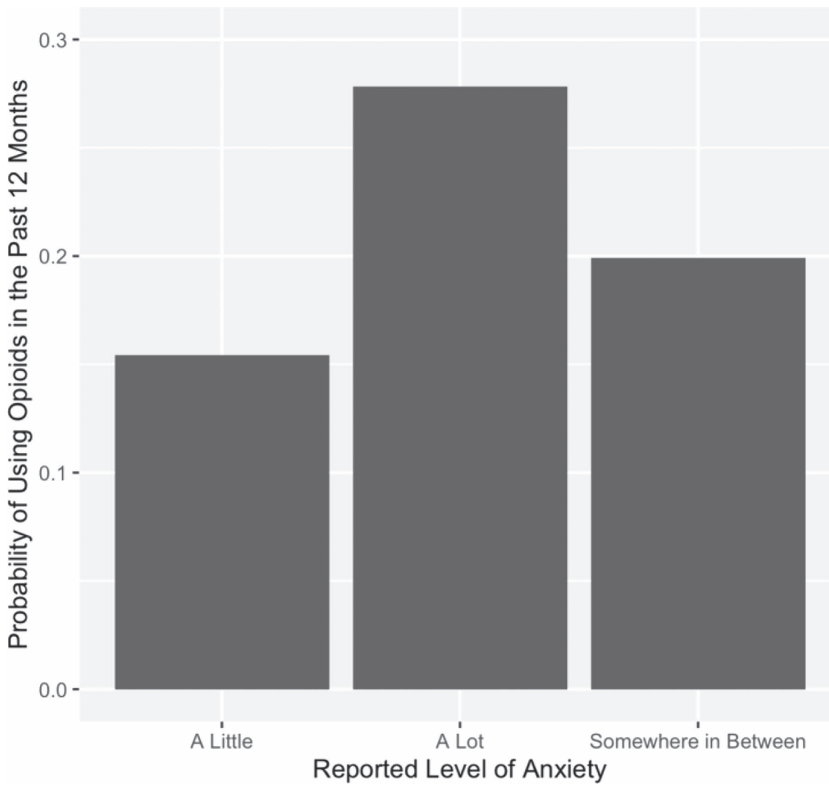


Figure 2: The Effect of Anxiety Level on the Probability of Using Opioids in the Past Year

There was also a significant correlation between whether a respondent took prescription medication for anxiety or depression and opioid use. Compared to people who did take medication for depression, the effect of not taking medication for depression decreased the likelihood of using opioids by a factor of 0.847 ($p < 0.001$). Figure three shows that people who took medication to treat their depression had a 15.3% probability of using opioids, while people who did not take medication had a 25.7% probability of opioid use. Similarly, people who did take medication for anxiety were less likely to use opioids by a factor of 0.178, relative to respondents who did take medication for anxiety ($p < 0.001$).

Discussion

Overall, this study showed that depression level, anxiety level, anxiety frequency, and taking medication for anxiety significantly affected opioid use in the past twelve months. As expected, higher levels of anxiety and depression correlated

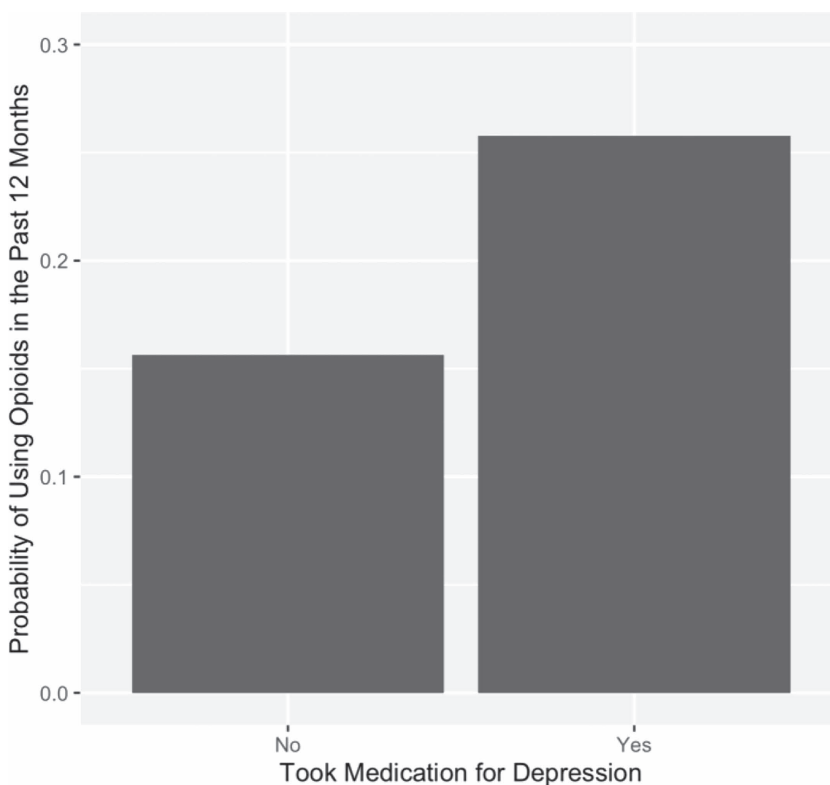


Figure 3: The Effect of Taking Prescription Medication for Depression on the Probability of Using Opioids in the Past Year

with increased opioid medication use. This finding is consistent with previous studies, which have shown that anxiety and depressive disorders can predict increased substance use disorders and higher relapse rates following substance abuse treatment.⁷ The fact that the odds ratio for depression level (1.609) was higher than that of anxiety level (1.071) suggests that depression may indicate more proclivity to engage in substance use than anxiety. Indeed, Mohammed et al. found slightly higher substance use rates among depression than anxiety patients.⁸ However, these findings may be due to multicollinearity between depression and anxiety, as common risk factors influence the development of both disorders.

7. Ikram Mohamed et al., "Assessment of Anxiety and Depression among Substance Use Disorder Patients: A Case-control Study," *Middle East Current Psychiatry*, 2020, 1, accessed June 3, 2020, <https://mecp.springeropen.com/articles/10.1186/s43045-020-00029-w>.

8. Mohamed et al., "Assessment of Anxiety," 1.

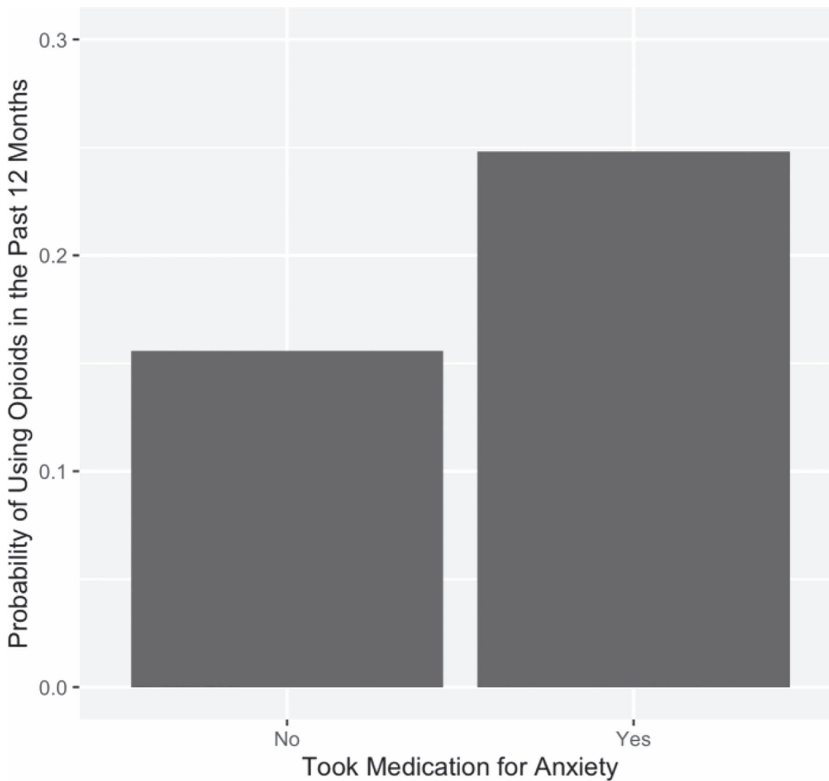


Figure 4: The Effect of Taking Prescription Medication for Anxiety on the Probability of Using Opioids in the Past Year

Moreover, the negative odds ratios between anxiety and depression indicate that respondents who took medication for depression and anxiety were more likely to have used opioids in the past year. This result contradicts my hypothesis that people with depression and other mental health conditions may self-medicate with opioids to alleviate their symptoms. One explanation for this finding is that patients with medication prescriptions may have more severe conditions, leading to increased opioid use. Another explanation is that respondents who used prescription medications may be more comfortable with engaging with different kinds of substances in general. However, patients with medications also have more contact with the health care system, which should mean more screening and support for substance use disorders. This result thus indicates that mental health services may be inadequate in addressing patient needs.

Nevertheless, other theories besides the self-medication hypothesis may explain the correlation between mental health disorders and substance theories. One theory is that common risk factors, such as genetic and environmental vulnerabilities, can contribute to both mental illness and substance use and

addiction. An additional theory is that pain may be a common comorbidity for people with mental health conditions. Depression and anxiety may cause individuals to feel pain more acutely or be less able to cope with it, leading them to use opioids to numb the pain.⁹

Limitations

This study has several limitations. First, I used cross-sectional, observational data from the NHIS. This data is not based on a randomized, controlled experiment design and thus does not demonstrate a causal relationship between having a mental health disorder and opioid use. As a result, the regression does not eliminate the possibility of reverse causality. Indeed, previous studies have suggested that opioid use can exacerbate symptoms of a mental illness. For example, Scherrer et al. found a positive association between the length of time a patient uses opioids and their risk of developing depression. Between 8.4 and 11.6 percent of people who used opioids for 1 to 30 days developed depression within the 12 months following their opioid use.¹⁰ More research is needed to clarify the relationship between mental health disorders and prescription opioid use.

Additionally, this study investigated the relationship between mental health disorders and opioid use among noninstitutionalized adults in the United States. Consequently, the findings are not generalizable to children, teenagers, and institutionalized adults. Lastly, the NHIS data is self-reported by patients, which may potentially cause inaccuracies. Previous studies suggest that survey respondents vary considerably in their willingness to provide accurate answers to questions regarding substance use behaviors and may underreport their drug use.¹¹ Moreover, the self-reported assessment of anxiety and depression level only consisted of three categories (a little, a lot, and in between), which is less rigorous than the outcomes used in other questionnaires—such as the PHQ-9 and GAD-7—and may therefore reflect a measurement error. Despite these limitations, this study sheds light on the relationship between mental health, pain,

9. National Institutes of Health, “Why Is There Comorbidity between Substance Use Disorders and Mental Illnesses?” National Institute on Drug Abuse, <https://www.drugabuse.gov/publications/research-reports/common-comorbidities-substance-use-disorders/why-there-comorbidity-between-substance-use-disorders-mental-illnesses>.

10. Jeffrey Scherrer et al., “Prescription Opioid Duration, Dose, and Increased Risk of Depression in 3 Large Patient Populations,” *Annals of Family Medicine*, 1, accessed January 2016, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4709156/>.

11. Timothy Johnson, “Sources of Error in Substance Use Prevalence Surveys,” US National Library of Medicine, last modified November 5, 2014, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4897110/>.

and opioid use, showing a significant overlap between America's mental health and opioid crises.

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EXPERIENCE OF STIGMA AND ITS RELATIONSHIP TO IDENTIFICATION WITH THE NEURODIVERSITY MODEL FOR INDIAN PARENTS OF CHILDREN WITH AUTISM SPECTRUM DISORDER

SAHITA MANDA, ELIZABETH BUVINGER, PHD, SHICHI DHAR
AND HARIKA VELDANDA

It is widely recognized that individuals with autism spectrum disorder (ASD) and their families continue to face extensive stigma and that much of the current research on ASD is deficit-focused. Diversity and inclusion perspectives are emerging, but there is less of a focus on how stigma affects the adoption of these approaches. In collaboration with the University of Michigan Department of Psychology and Action For Autism, a national Indian organization, our research aims to understand the experience of stigma and its relationship to identification with the neurodiversity model for Indian parents of children with ASD. The neurodiversity model proposes that ASD is a natural variation of human behavior that should be celebrated (Jaarsma & Welin, 2011). The study was carried out by administering online surveys through Qualtrics to Indian parents residing in India (N=82; full data n=56). This study explores the extent to which Asian value adherence, child functioning, and perceived ASD stigma contribute to parental alignment with the neurodiversity model. It also investigates the ways in which alignment with the model affects parental stress, isolation from family and friends, parenting goals, identification of child's strengths, and positive perceptions about raising a child with ASD. Preliminary findings demonstrate statistically significant correlations between a child's ASD behaviors, perceived ASD stigma, parental stress, and isolation from family and friends. A more complex mediation model of the effects of neurodiversity alignment on these variables will be evaluated in the future and will have implications for the adoption of strength-based practices and the reduction of stigma associated with ASD within different cultural contexts.

Contact: Sahita Manda, Elizabeth Buvinger, PhD, Shichi Dhar and Harika Veldanda

ANALYZING THE EFFICACY AND UTILITY OF THE AMERICANS WITH DISABILITIES ACT OF 1990 ON COLLEGE STUDENTS WITH DISABILITIES

MAGDA WOJTARA

Many adults in the United States suffer from one or multiple disabilities. In the college student population approximately 19% of college students suffer from a disability (National Center for College Students with Disabilities, 2018). Commonly experienced disabilities include, but are not limited to, attention deficit hyperactivity disorder (ADHD), learning disabilities, chronic illness and other disabilities (National Center for College Students with Disabilities, 2018). The Americans with Disabilities Act (ADA), a civil rights act preventing discrimination based on disability, was first passed in 1990 and was amended in 2008 to include a more inclusive definition of disability. Previous studies suggest that the ADA has improved accessibility for individuals with disabilities. The hypothesis of this project is that while the ADA has improved accessibility for individuals with disabilities, many individuals with disabilities still do not have access to appropriate accommodations. Furthermore, the hypothesis suggests that these individuals, especially those with invisible disabilities, remain stigmatized. To test this hypothesis, an in-depth literature review was conducted alongside a brief survey that was distributed to undergraduate students at multiple universities. The data from this study reveal that the ADA was successful in some aspects of providing protections for individuals with disabilities, but ultimately that reform is still needed to ensure appropriate accommodations for individuals with disabilities on college campuses. Future studies would further explore the relationship between various intersectional identities including but not limited to race, religion, and sexual orientation and disability accommodations.

Introduction

Evidence is accumulating that students with disabilities still experience accessibility issues and stigmatization. This is especially true for those with invisible

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identities. There are many barriers that prevent students with disabilities from participating in many academic and social settings due to a lack of sufficient usable accommodations (National Center for College Students with Disabilities, 2018). The Americans with Disabilities Act, passed in 1990 and amended in 2008, is the most recognizable anti-discrimination legislation for individuals with a disability. This legislation made strides by putting in place protections, which were previously not present, for individuals with disabilities (Figure 1). Section 504 of the ADA stipulates that institutions of higher education only provide reasonable accommodations when requested by the student which is in contrast to legislation in place for students in primary and secondary school where the onus falls on the school for identifying students that need support and providing the needed support (Kreider, Bendixen & Lutz, 2015). It is our expectation that this study will demonstrate that improvements have been made since the passage of the ADA but that some accommodations are not sufficient or usable for individuals with disabilities. Despite increasing information, finding studies relating stigmatization and accessibility issues in college students with disabilities to the ADA has proved challenging.

Such research is crucial and topical because it helps to identify areas in which the ADA is sufficient and areas where reform may be needed. There is a growing need for finding out the real-world efficacy of ADA legislation and related legislation. It is also important to see and discern if there are any trends within the college student population that are more broadly applicable to our understanding of the effectiveness of the ADA. The investigation on effectiveness of the ADA in a college student population was because of existing gaps in the current literature. Previous research at nearly 230 health and fitness centers across 10 states has identified that people with physical and mobility disabilities have limited access to programs, equipment and services and had higher accessibility scores compared to before the ADA but that these were still barely sufficient and often resulted in a lack of usability (Rimmer, Padalabalanarayanan, Malone & Mehta, 2017). Previous research also shows that individuals with disabilities are

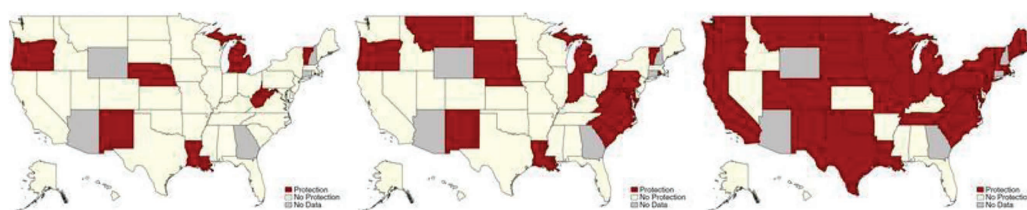


Figure 1: Geographical Distributions of Legal Changes in 1981, 1985 and 1989. States with strong employment protection laws are shaded in black and those with weak protections are in white. The five states shaded in grey were states where it could not be identified what year the legislation was enacted (Kim & Rhee, 2018).

less able to participate in preventative services such as mammograms, pap tests and dental cleaning (Pharr & Bungum, 2012). Furthermore, some adjustments made under the ADA for individuals who are blind, fall short of what they could accomplish for individuals with low vision (Arditi, 2017). This is yet another example of how the ADA has resulted in increased accessibility, but often not real-world usability.

In educational settings many professional programs grapple with providing students with the necessary support. For example, Doctor of Pharmacy Programs (PharmD) struggle with providing disability-related accommodations for skills-based laboratory and experiential performance assessments (Volino, Allen & Gallimore, 2021). On the other hand, libraries have been able to vastly improve accessibility in a cost-effective manner which can serve as a model for how to provide ADA-compliant and effective accommodations (Willis, 2018). It is also known that there are high rates of peer victimization in college students with disabilities (Lund & Ross, 2021). Additionally, many college students with different disabilities face unique challenges in adjusting to higher education meaning there is no “one size fits all” approach to supporting students (Lipka, Sarid, Aharoni, Bufman, Hagag & Peretz, 2020). To investigate how effective the ADA has been in improving accessibility and reducing discrimination for individuals with disabilities we sampled 150 college students alongside a literature review. The survey questions contained three sections and students indicated their agreement with the statements on a scale of strongly agree to strongly disagree.

Methods

Recruitment and Participants

Participants were recruited from a multi-university undergraduate student sample from the midwestern United States. Social media, recruitment flyers, word of mouth and email announcements via school-based email lists were utilized in study recruitment of students with disabilities for the study. Informed consent was obtained from each participant within the anonymous survey which was distributed by individuals other than the research team member. The project did not include any access to identifiable private information, intervention or interaction. Participants were 152 students from 2-year and 4-year institutions in the midwestern United States with an age range of 18–25. Student participants therefore included traditional and non-traditional undergraduate students. The study sample was approximately 57% female, 40% male and 3% nonbinary or other identification. The majority of conditions represented in the study were

learning or mental disabilities. The study was exempt from review by the IRB due to the nature of the survey.

Literature Review

For additional information, an in-depth literature review was conducted based on relevant search terms. Previous literature provided additional context for changes and outcomes relating to the ADA and students with disabilities. Databases such as PubMed were utilized with the following search terms: “ADA”, “ADA and College”, “Disability and College”, and “Invisible Disability and College.” Except for papers pertaining to just the passage and immediate impacts of the ADA, all other pieces of literature were published within the past 10 years. Much of the literature (n=30) that ultimately provided relevant information was published in the past 2 years which may be indicative of increased conversations on disabilities in higher education. Considering the COVID-19 pandemic, this recent research has helped to shed light on potential impacts of the pandemic on accommodations for individuals with disabilities.

Procedure

The author and research team member had previous experience in collecting data for several clinical research studies. A graduate student enrolled in the social work program assisted with data presentation, phrasing, and general advice. The anonymous survey was distributed for a month to students with disabilities with no follow up, individual interviews or focus groups. The survey included a few questions relating to the type of disability, degree of accommodation, barriers, and ability to report ADA noncompliance (Table 1). These questions had responses that included the following: Strongly Disagree, Disagree, Neutral, Strongly Agree, and Agree. The survey also collected basic demographic data namely: gender, sexual orientation, age, and category of disability. These questions were generated by the researcher based on their relevance to the study goals.

Results

The results of the small-scale survey are recorded below in the following images. Students with disabilities were asked to answer the survey questions and indicate their level of agreement with the statements. 79% of students indicated that

Survey Questions Distributed to Students	
1)	Type of Disability and Experiences a) I have a disability that poses physical barriers b) I have a disability that poses social barriers c) I have a disability that poses academic barriers d) I have recently been diagnosed with my disability e) I have been discriminated against due to my disability f) I have been discriminated against or harassed for having an invisible or hidden disability
2)	University Resources a) In general, I have always received appropriate accommodations for my disability b) I attend a school that has enough resources for students with disabilities c) I feel supported as a student with a disability at my school d) I feel that teachers/teaching staff are accommodating of my disability e) I feel that learning materials in classrooms are accessible to me f) I feel that classrooms, libraries, gyms and other facilities are accessible to me.
3)	Policies and ADA a) I am familiar with my rights under the Americans with Disabilities Act and other legislation b) I am satisfied with my ability to report ADA violations and/or misconduct c) I am satisfied with the accommodations that I receive as a student with a disability d) I am satisfied with my ability to participate in campus life due to spaces being accessible

Table 1: Survey questions sent to students with disabilities following the collection of demographic data information. All these questions had the following answer options: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree.

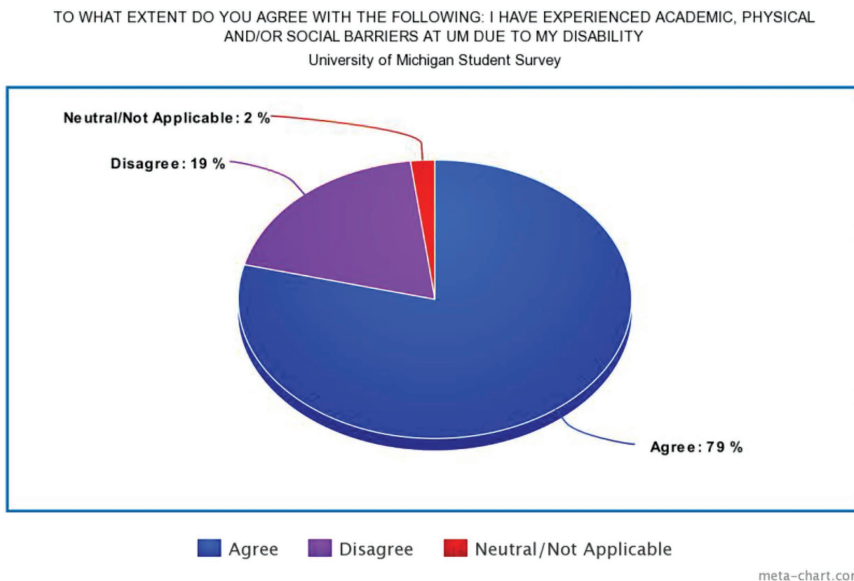


Figure 2: Results of survey conducted. Participants were asked to indicate if they agreed or disagreed with the statement: I have experienced academic, physical and/or social barriers at the University of Michigan due to my disability.

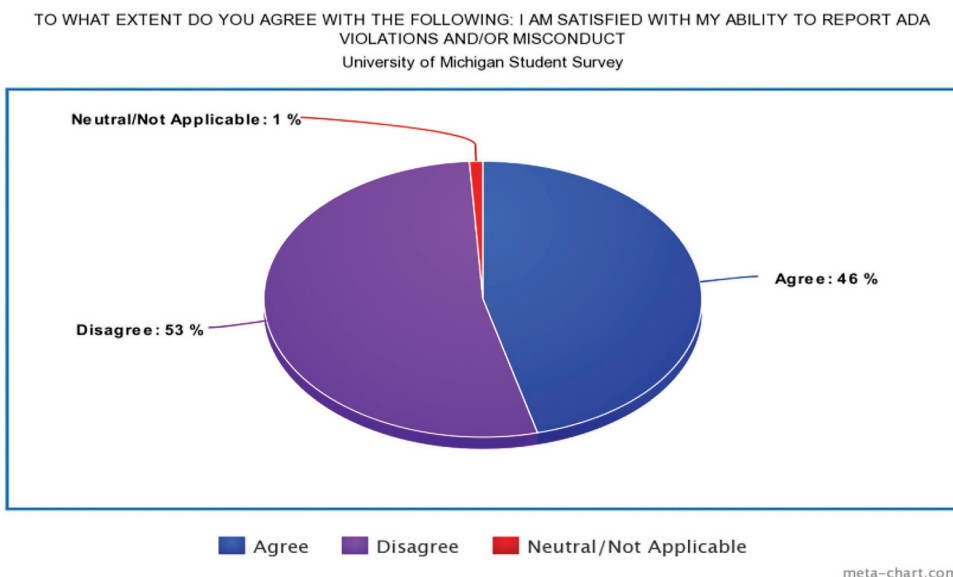


Figure 3: Results of survey conducted. Participants were asked to indicate if they agreed or disagreed with the statement: I am satisfied with my ability to report ADA violations and/or misconduct.

they faced academic, physical and/or social barriers (Figure 2). This means that many students with disabilities felt that barriers had not been ameliorated by existing infrastructure and systems. Additionally, 48% of students indicated that they were satisfied with their ability to report ADA violations and/or misconduct (Figure 3). This implies that several students may not be able to report ADA violations or challenges they are facing with current systems. Lastly, only 31% of students surveyed indicated that they have always received appropriate accommodations for their disability. This means that a vast majority of students with disabilities are not receiving accommodations to the extent that appropriately meets their needs.

The literature review yielded additional insights and context for the proposed hypothesis. A main theme included that many felt that systemic issues in education for students with disabilities were exacerbated by the pandemic and pivot to virtual learning (Luterman, 2022). A recent review article analyzed peer-reviewed qualitative studies published between 1994 and 2017 and utilized the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) as well as the Critical Appraisal Skills Programme (CASP) to select 10 articles (Gow, Mostert & Dreyer, 2020). Data from this review showed many things including: 1) many students in higher education experience the fear of stigmatization and do not disclose their disability status and need for additional support 2) higher education institutions (HEI) are not meeting the diverse needs

TO WHAT EXTENT DO YOU AGREE WITH THE FOLLOWING: IN GENERAL, I HAVE ALWAYS RECEIVED APPROPRIATE ACCOMMODATIONS FOR MY DISABILITY

University of Michigan Student Survey

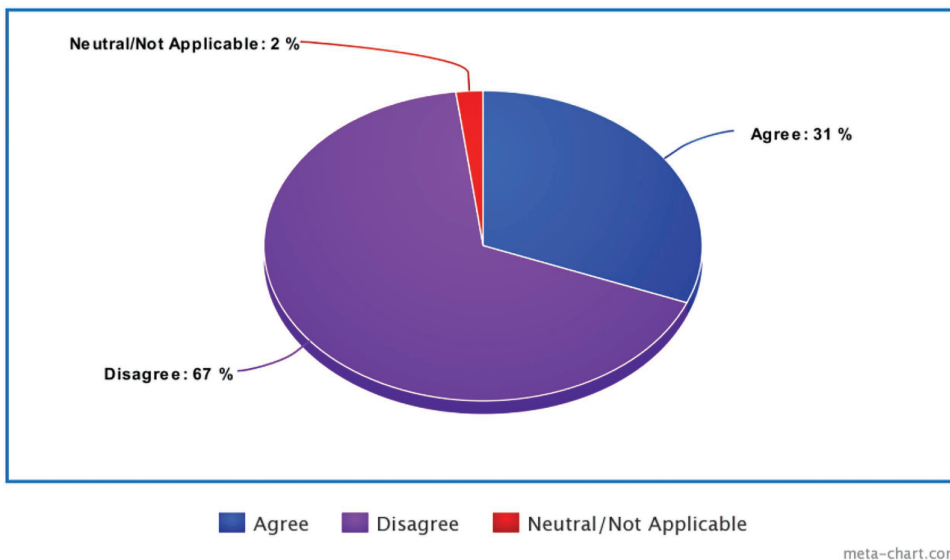


Figure 4: Results of survey conducted. Participants were asked to indicate if they agreed or disagreed with the statement: I have always received appropriate accommodations for my disability.

of their student body and that staff is not trained or equipped to support diverse needs 3) variable accessibility across different departments even within the same HEI 4) many students with disabilities rely on support from their family, friends and peers (Gow, Mostert & Dreyer, 2020).

Other research suggests that the COVID-19 pandemic has had an even greater impact on disabled students. A report published by the Center for Reinventing Public Education analyzed more than 400 case reports and research papers. The CRPE found that 82% of school districts reported that it was difficult to provide “hands-on” accommodations for students with disabilities during remote work (Morando-Rhim & Ekin, 2021). Indeed, less instructors were confident in their ability to meet the requirements of Individualized Education Programs (IEPs) for students with disabilities (Stelitano, Mulhern, Feistel, Gomez-Bendaña, 2021). Students with disabilities also trended toward reporting negative experiences with virtual learning environments (McMaughan, Rhoads, Davis, Chen, Han, Jones, Mahaffey, & Miller, 2021).

Even among college students, there were additional disparities indicated by the literature for those enrolled in STEM (science, technology, engineering and mathematics) courses. Students with disabilities are underrepresented in undergraduate STEM majors as they only make up 5% of students enrolled in STEM

undergraduate degree programs despite making up 26% of the US population (Centers for Disease Control and Prevention, 2018). STEM courses and STEM careers have generally been found to be particularly unwelcoming to students with disabilities when compared with non-STEM courses and careers (Duerstock & Shingledecker, 2014 and Wells & Kommers, 2020). Undergraduates with disabilities that are majoring in STEM are less likely to receive accommodations than their peers majoring in other non-STEM disciplines (Lee, 2014).

To maintain compliance with the ADA and similar legislation, many colleges and universities have created Disability Resource Centers (DRCs) (Gin, Guerrero, Brownell & Cooper, 2021). These centers serve many functions but many have a variety of ways to support students with disabilities such as by providing note-takers, and test-taking services. However, many undergraduates are not aware that the DRCs exist or have cited that the resources are unclear or difficult to access (Gin, Guerrero, Brownell & Cooper, 2021). Students with disabilities at the K-12 level have also indicated that they had less overall support and fewer accommodations for their disability in online courses compared to in-person courses (Terras, Anderson & Grave, 2020).

Conclusion

The results of this preliminary study suggest that the ADA has improved accessibility for individuals with disabilities since its first implementation, however, many individuals with disabilities still do not have access to appropriate accommodations. Furthermore, this study suggests that these individuals, especially those with invisible disabilities, remain stigmatized. In order to further validate these findings, similar studies should be conducted to determine if this trend can be extrapolated to individuals of a variety of backgrounds. In future studies researchers can also analyze the impacts of any new legislation or amendments to the ADA. Additionally, future studies can run interviews and focus groups. Namely, semi-structured interviews and focus groups would be beneficial in discerning specific narratives and valuable qualitative insights. It may be interesting to study distinctions and similarities in other age groups as well. Future studies should include these components for a more in-depth analysis. This study contributes to a broader understanding of disabilities and disability accommodations in the college student population.

Due to the rapid and unprecedented effects of the COVID-19 pandemic, education and educational accommodations suffered for some students with disabilities. On the other hand, some students with disabilities may have benefited from the flexibility of remote instruction (Morando-Rhim & Ekin, 2021). Improvements have been made since the passage of the ADA but that some accommodations are not sufficient or usable for the unique needs of different students with

disabilities. As the pandemic continues, thoughtful reopening plans that account for the specific needs of students with disabilities should be crafted with input from key stakeholders (e.g. parents, instructors, students) along with medical and public health professionals (McLaughlin & Vercler, 2020).

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THE RELATIONSHIP BETWEEN STUDENT LIVING SITUATION AND THE EFFECTS OF COVID-19 DURING THE 2020–2021 ACADEMIC YEAR AT THE UNIVERSITY OF MICHIGAN

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SAMIR GADEPALLI, MD, MBA¹

College students worldwide were heavily impacted by the COVID-19 pandemic, as classes switched from in-person to remote. The switch to remote classes contributed to increased off-campus living. Many college students believed that they were missing out on new experiences and opportunities by living off-campus. The purpose of this study was to understand how living on-campus differed from living off-campus during the 2020–2021 academic year. A Qualtrics survey consisting of a variety of quality of life (QOL) questions was sent out to students attending the University of Michigan (U-M); participants ($N = 66$) were asked to assess the effect of COVID-19 on their diet, education, exercise, sleep, and social activity. This study also briefly examined the mental and physical health of participants. Independent t-tests were performed to determine if there were any significant differences between on-campus and off-campus participants in relation to the five aforementioned factors. It was found that whether participants lived on-campus or off-campus, their education, exercise, sleep, and social activity were similarly affected by COVID-19. The diet of participants, however, was affected less for on-campus students than off-campus. It is hopeful that the findings presented here will help identify problem areas associated with COVID-19 to improve the QOL of college students.

Keywords

COVID-19, college students, living situation, mental health, physical health

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Background and Introduction

On March 11, 2020, COVID-19 was characterized as a global pandemic (World Health Organization (WHO), 2020). In an effort to mitigate the spread of the virus, colleges switched from in-person to remote learning (Centers for Disease Control and Prevention (CDC), 2022). This switch in learning format had its consequences; there is evidence that COVID-19-related school closures had a negative effect on the academic achievement and performance of students (Hammerstein et al., 2020). For example, it was found in a study involving students from Hanyang University College of Medicine in Korea that there was a significant decrease in average test scores in 10 out of 16 classes (62.5%) that transitioned to an online format (Kim et al., 2021). Another study concluded that COVID-19-related school closures resulted in learning loss, particularly among students from disadvantaged and low socioeconomic status (SES) homes (Engzell et al., 2021). Often, these students do not have the same privileges as their high-SES peers, such as the availability and support of parents, reliable access to the internet and technology, and secure housing (George et al., 2021; Lederer et al., 2020).

Online classes also raised concerns about the mental and physical health of educators and students alike. In a study conducted at a large public United States university, participants reported increased snacking due to the COVID-19 pandemic (Son et al., 2020). Additionally, they reported that the COVID-19 pandemic led to them experiencing depressive and suicidal thoughts (Son et al., 2020). Social isolation, which is exacerbated by the previously discussed changes to learning, was commonly cited as a key contributor to poor mental and physical health (Elmer et al., 2020; Michigan Medicine Department of Psychiatry, 2020, Son et al., 2020).

Although it is well-known that the COVID-19 pandemic has adversely affected the education, mental health, and physical health of college students, the role that living situation (i.e., on-campus versus off-campus) played in modifying the pandemic remains to be explored. Many college students believed that living off-campus during the 2020–2021 academic year meant missing out on new experiences and opportunities, but it is uncertain if there were truly advantages or benefits of living on-campus. This study utilizes a Qualtrics survey that was distributed at the University of Michigan (U-M) campus in Ann Arbor, Michigan to better understand the relationship between the effects of COVID-19 and living situation. Ultimately, these findings could help identify problem areas in the QOL of college students amid the pandemic and give us a better idea of how to address them.

Methods

Participants and Procedure

The survey used in this study was administered via Qualtrics. It was advertised and distributed to U-M students through the monthly Undergraduate Research Opportunities Program (UROP) email newsletter and several group chats, such as a 30-member U-M Housing GroupMe and an over 5000-member U-M Discord community server. All messages had a brief description of the study, its purpose, and an anonymous link to the survey. The survey was open from November 2020 to January 2021. The participants were able to take it at any time within that time frame. There were 66 responses from U-M students. Of the respondents, 44 were female (66.7%) and 22 were male (33.3%). Twenty identified as Asian (30.3%), 4 identified as black and African American (6.1%), 37 identified as Caucasian (56%), 4 identified as other (6.1%), and 1 preferred not to say (1.5%). The average household income of participants was varied: 8 reported under \$25,000 (12.1%), 12 reported between \$25,000 and \$50,000 (18.2%), 14 reported between \$50,000 and \$100,000 (21.2%), 18 reported between \$100,000 and \$200,000 (27.3%), 8 reported over \$200,000 (12.1%), and 6 preferred not to say (9.1%). The living situation of participants was almost evenly split during the 2020–2021 academic year, as 35 lived on-campus (53%) and 31 lived off-campus (47%). Within the on-campus group, 24 participants were female (68.6%) and 11 were male (31.4%). A majority of participants identified as either Asian (31.4%) or Caucasian (57.1%). Within the off-campus group, 20 participants were female (64.5%) and 11 were male (35.5%). Like the on-campus group, a majority of participants identified as either Asian (29%) or Caucasian (54.8%).

Survey Content

The Qualtrics survey had a total of twelve questions. Participants were asked for general demographic information (e.g., age, household income, and race and ethnicity), as well as COVID-19- and health-related questions (e.g., “How would you describe your physical health? How would you describe your mental health? Are you worried about contracting COVID-19?”). For the health-related questions, participants were given the options of poor, fair, good, very good, or excellent. Question 11 specifically asked participants to assess the effect of COVID-19 on the following five factors using a Likert-type scale: diet, education, exercise, sleep, and social activity. The Likert-type scale ranged from 0 to 10, with 0 being low and 10 being high. Lastly, question 12, which was an optional open response, asked participants if they had anything else to add.

Data Analysis and Collection

After the closure of the survey, independent t-tests were performed with JASP to determine if there were any significant differences between the responses of off-campus and on-campus participants for each of the five factors (i.e., diet, education, exercise, sleep, and social activity). A p-value of less than 0.05 was considered significant. Box and whisker plots were generated to visualize the results (Figure 1). The responses to the mental and physical health questions were also compiled and examined for general differences and trends (Figure 2).

Discussion and Results

Diet, Education, Exercise, Sleep, and Social Activity

As shown in Figure 1 and Table 1, there was not a significant difference between the responses of on-campus and off-campus participants in terms of education, exercise, sleep, and social activity. There was, however, a significant difference in their dietary habits. This finding adds to past studies that have reported increased snacking, inconsistent eating patterns, and reduction in nutritious food consumption due to the pandemic (Son et al., 2020). There are a few reasons for why off-campus college students might not be able to maintain healthy diets, such as financial insecurity and little or no access to food pantries and grocery stores (Balch, 2020). It is also likely that the diet of U-M students living in the residential halls is influenced by the requirement of having an unlimited meal plan (Michigan Dining, 2022). Notably, the averages of participants' responses to all five factors tend towards the mid- to high-end of the scale regardless of living situation. Education ($M = 8.62$, $SD = 2.34$) and social activity ($M = 9.57$, $SD = .90$) were the most affected, whereas sleep ($M = 4.52$, $SD = 2.57$) was the least affected. With classes being online, there are fewer opportunities to socially interact in both a classroom setting and social context, but there is also less travel time and fewer in-person commitments, which could lead to more sleep.

Mental and Physical Health

Participants were asked the following questions: "How would you describe your physical health?" and "How would you describe your mental health?" Figure 2 depicts the distribution of responses to these questions. Interestingly, 53 out of 66 (80.3%) participants described their physical health as good, very good, or excellent, whereas only 24 out of 66 (36.4%) participants described their mental

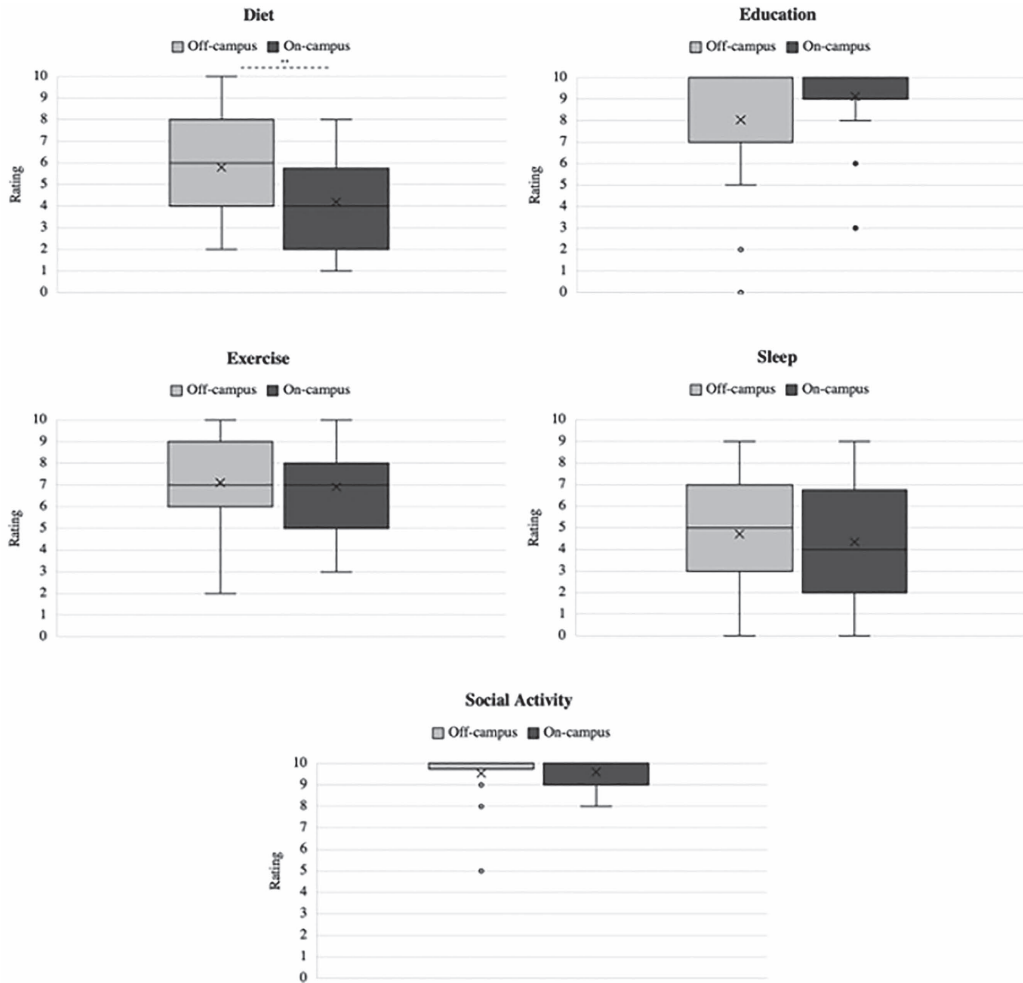


Figure 1: Box and whisker plots for diet, education, exercise, sleep, and social activity of participants. Off-campus is in dark gray and on-campus is in light gray.

health as good, very good, or excellent. Most participants (39.4%) described their mental health only as fair. These results suggest that participants were able to find ways to maintain their physical health despite the pandemic. Mental health, however, was hit harder by remote classes and quarantine. The lack of social activity could be linked to participants' mental health only being fair. In fact, surveys within the first month of the pandemic revealed that feelings of loneliness increased by twenty to thirty percent, and emotional distress tripled (Holt-Lunstad, 2020). The results presented here in the study support the recent and urgent need to address the consequences that the pandemic has on mental health (Holmes et al., 2020).

Effect of COVID-19 on Diet, Education, Exercise, Sleep, and Social Activity				
Factors	Statistics	Off-campus	On-campus	P-Value
Diet	Mean	5.79	4.12	.01
	Range	2 - 10	1 - 8	
	SD	2.38	2.22	
Education	Mean	8.03	9.11	.06
	Range	0 - 10	3 - 10	
	SD	2.97	1.51	
Exercise	Mean	7.11	6.91	.73
	Range	2 - 10	3 - 10	
	SD	2.41	2.08	
Sleep	Mean	4.71	4.34	.58
	Range	0 - 9	0 - 9	
	SD	2.49	2.66	
Social Activity	Mean	9.53	9.60	.77
	Range	5 - 10	8 - 10	
	SD	1.07	.74	

Table 1: The statistics (i.e., mean, range, and standard deviation), as well as p-values from the independent t-tests for diet, education, exercise, sleep, and social activity of respondents. A p-value of less than 0.05 is considered significant.

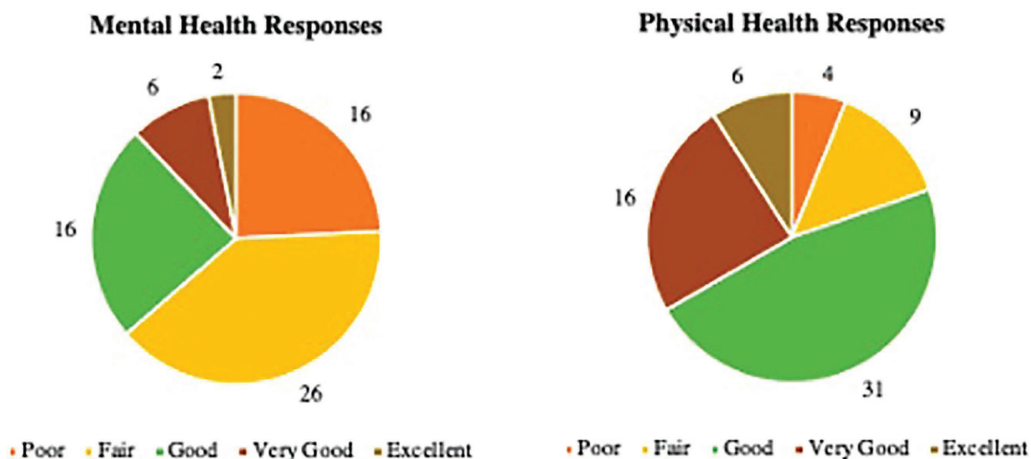


Figure 2: Pie charts depicting the response distributions for the “how would you describe your mental health?” and “how would you describe your physical health?” questions in the Qualtrics survey.

Participants' Comments

The last question of the survey gave participants the chance to provide their own comments regarding COVID-19 and the 2020–2021 academic year (Table 2). There were 6 participants who responded, approximately half female and half male. Their ages ranged from 18 to 21, and all but two participants identified themselves as Caucasian. Several of the comments indicated frustration with their education (e.g., “professors need to make their classes easier [. . .] we can’t be on the screen for hours and hours on end” and “the University is doing a terrible job helping students during this time. . .”). Other comments, such as those from participants “C” and “D,” further highlight the effect that COVID-19 has on mental health. Overall, these comments from participants bring up interesting avenues for future study (e.g., financial and pre-existing challenges), and lend a more personal perspective on issues associated with COVID-19. There is nevertheless a collective sentiment that the pandemic has been a negative and stressful experience.

Comments Regarding COVID-19 and 2020–2021 Academic Year	
Participant “A”	“Professors need to make their classes easier, their assignments lessened understanding we can’t be on the screen for hours and hours on end!”
Participant “B”	“COVID has mainly had a negative influence on all these areas.”
Participant “C”	“I feel as though my entire life has been flipped upside down by the virus. My already abysmal life became a black hole, and I am currently on the cusp of failing out of the University. I am financially burdened and feel I have no resources to aid me in my situation.”
Participant “D”	“I have pre-existing mental health issues whose effects are exacerbated since I am in quarantine. It’s hard getting quality distractions/relief.”
Participant “E”	“I am worried about contracting covid more due to the fear of spreading it to my parents than the fear of having it myself.”
Participant “F”	“The University is doing a terrible job helping students during this time, we need a break.”

Table 2: Responses to the “Is there anything else you want to add?” question.

Conclusion

This study provides insight into how the COVID-19 pandemic has affected life for college students, and analyzes the relationship between these effects and their places of residency. The findings presented here suggest that making more resources focused on enhancing education, diet, social activity, and mental health available to students would most effectively improve their QOL. For example, free public transportation to grocery stores would greatly help students, especially those who do not have their own vehicle, with their diet. For mental health, it has been demonstrated that individual counseling and peer support groups are useful tools for reducing anxiety and depression (Viswanathan et al., 2020; Suresh et al., 2021). Of course, this study has its limitations and only tells part of the story. One limitation is that there were no explicit definitions for on-campus and off-campus. The participants simply responded with yes or no to the question of “Are you currently living on-campus?” Future research should specify what is considered on-campus (e.g., residence halls) versus off-campus (e.g., living with parents), as well as include a larger and more representative sample of college students by surveying at different campuses. Additional questions to probe for specific variables that might contribute to the differences between living on-campus versus off-campus would be helpful too (e.g., “How are you maintaining your physical health” and “Why would you describe your mental health as only fair?”). By asking these questions, the COVID-19-related issues that are faced by on-campus and off-campus college students can be further identified and addressed.

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OXIME-CONJUGATED DENDRIMERS AS THERAPEUTICS FOR ORGANOPHOSPHATE POISONING

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Organophosphates (OPs) are a class of organophosphorus compounds which have a general structure of $O=P(OR)_3$. Paraoxon (also known as POX) is an organophosphate found in insecticides often used in agriculture in impoverished countries. OPs are also used in nerve gas agents such as Sarin gas, used in warfare. These molecules are extremely toxic and can be lethal at low doses. Organophosphates negatively impact the body's neurotransmitter enzyme, acetylcholinesterase. Muscle spasms, paralysis, narrowed pupils, glossy eyes, confusion, and the over-secretion of bodily fluids such as sweat, saliva, mucus, and tears, are symptoms of organophosphate poisoning (Fletcher, 2017). To reduce the harmful effects from this organic compound, we have designed and screened dendrimer nanoparticles modified with poly (ethylene glycol) chains and with small reactor molecules. Dendrimers are synthetic macromolecules, which contain chains of repeated, branching molecules that form a tree-like or snowflake-like structure. Dendrimers can be used to enhance permeability in drug delivery. There are many active sites attached to small reactor molecules on the dendrimer branches, allowing for the successful and efficient inactivation of POX before penetrating the skin (Mukherjee, 2015). The second focus of our experiment was to screen for hundreds of oxime molecules that most effectively reactivate acetylcholinesterase. Oxime molecules are an organic imine compound that can be used to detach the toxic OPs from acetylcholinesterase. OP's bind to Ser²⁰⁰ on the enzyme, leading to inactivation. Oxime molecules bind in a nucleophilic attack to the phosphorus on organophosphate, causing it to diffuse away from the enzyme. This paper highlights the two focuses of our experiment: 1. Perform enzyme assays to screen for the best compounds at reactivating acetylcholinesterase, and 2. Attach oxime molecules at the branching sites of dendrimers to enhance permeability into

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the subdermal layer of the skin. We have identified some potential oxime molecules and dendrimers to be complexed and used as a treatment for OP poisoning or incorporated into a cream-based drug product to protect those at high risk of exposure to organophosphates.

Introduction

Acetylcholine (ACh) is a small signaling molecule released in a synapse from the axon of nervous cells. ACh binding to its receptor sends chemical impulses to other nerve cells. Acetylcholinesterase (AChE) breaks down an excess of acetylcholine after a sufficient stimulation on the neighboring nerve cell is made. If the enzyme is inhibited by organophosphates (OPs), the remaining ACh continues to stimulate the nerves, resulting in diarrhea, hypertension, muscle spasms, etc. (Fletcher, 2017). The neuropsychiatric effects of organophosphate poisoning include another extensive list of symptoms including impaired memory, confusion, irritability, lethargy, psychosis, etc. There are almost 3 million poisonings per year with a result of 200,000 deaths (Eddleston, 2002, p. 275).

The phosphorus atom in the organophosphate binds to the hydroxyl group in the active site of acetylcholinesterase, deactivating the enzyme. Oxime molecules, with a general formula $RR'C=NOH$, also contain a hydroxyl group (J. Biol. Chem, 2011, p. 286). When in the presence of the poisonous compound, the hydroxyl group of the oxime molecule does a nucleophilic attack on OP's phosphorous, causing it to detach from the enzyme (Eddleston, 2002, p. 275). This oxime-phosphonate formation is an irreversible reaction, allowing AChE to remain activated. Below are some examples of reference oxime compounds already used commercially.

Although effective, the side effects of oximes include vomiting, nausea, confusion, dry eyes and mouth and muscle weakness (Institute of Medicine, 2000). Our goal is to reduce the harmful effects of these OPs by designing a topical cream that can be used in the event of dermal exposure to organophosphates, particularly

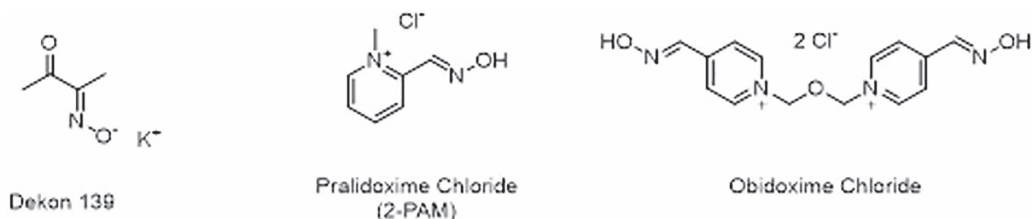


Figure 1: Three different oxime molecules that have been patented and used commercially against organophosphate toxicity.

in the agricultural sector. We hypothesize that the use of oxime-conjugated dendrimers will reverse the effects of the OPs, allowing for the reactivation of acetylcholinesterase. By screening different oxime small molecules, we can compare the enzymatic reactivity of AChE with other post-market products such as 2-PAM and Obidoxime. Within our experiments, we tested the reactivity of acetylcholinesterase after exposure to POX, and we designed a system to test skin penetration of the dendrimers using Franz cells and Ultra-Pressure Liquid Chromatography.

Methods

AChE Enzyme Reactivation Assays

Assays are used to test how effectively the oximes reactivate the enzyme acetylcholinesterase after it has been deactivated by paraoxon. The frozen enzyme is first thawed. The AChE is then vortexed with one-part enzyme, 499 parts pH 8 PBS. The amount of enzyme needed varies depending on how many oximes will be tested. We diluted POX with a serial dilution to test it at different concentrations. A serial dilution like this can be used to create a calibration curve of POX concentration vs enzymatic reactivity. In pH 8 PBS, we dilute the organophosphate anywhere from 20 μM to 0.156 μM . In the following order, solutions are added to the 96 well plates: pH 8 PBS (50, 70 or 80 μL), AChE (100 μL), and POX (10 μL). The plates are then incubated for 30 minutes to let the POX deactivate the enzyme AChE. Afterwards, 20 μL of the different oxime conjugates are added to each row (except for the control row), ranging anywhere from 0.01mM to 10mM. Our oxime molecules were synthesized in the lab apart from 2-PAM and Obidoxime chloride, which were purchased through Fisher Scientific. Although the synthesis of attaching the oxime molecules to the PAMAM dendrimers is not discussed here, Bharathi's (2014) research and design on oxime-conjugated PAMAM dendrimers was modeled. (Bharathi, p. 1068–1078). We used Obidoxime and 2-PAM as controls, which are already marketed oxime products. A fresh 1:1 mixture of acetylthiocholine chloride, ATCh, and 5,5'-dithio-bis (2-nitrobenzoic acid), DTB, are weighed out and dissolved into DMSO and PBS 8.0. This 1:1 mixture of ATCh (5.0 mM, 3.0 mL) and DTNB (5 mM, 3.0 mL) is labeled as "AT/DT," and it shall be used as a substrate to measure the enzymatic reactivity of acetylcholinesterase. 20 μL of the substrate is pipetted swiftly into each well with a multi-channel pipette. Prior to adding the substrate, the plate reader is set to an absorbance of 412nm and to read enzymatic activity every 2 minutes for 20 minutes. Enzymatic activity is measured by detecting absorbance via color change from clear to yellow upon addition of the AT/DT mixture. The higher the reactivity of the enzyme

acetylcholinesterase, the darker the yellow would appear in the wells after the reaction has reached completion. Figure 2 shows an example of a 96 well plate setup that was tested:

Plate 706-41C series (each well 200 μ L)

- Buffer, PBS pH 8.0: variable volume (80, 70 or 50 μ L)
- AChE: 100 μ L each fixed
- POX = 10 μ L each fixed volume
 - Row A: variable concentration
 - Row B to H: 10 μ M
- Test oxime solution: 20 μ L each, variable concentration (0.01–10 mM) as noted in the upper row
- AT/DT: 20 μ L each fixed

POX decontamination in porcine skin tissue

We test how long it takes for the POX to be removed from the skin using Franz cells, which clamp the skin tissue in place. Pig skin is used for this experiment because it is most similar to human skin. In this experiment, we recreated a makeshift human-synapsis with a pH buffer of 7.4 absorbing the internal side of our pig skin, since the human body has a natural pH of around 7.4. We add

706-41C	1	2	3	4	5	6	7	8	9	10	11	12
	Oxime= 0.25mM			Oxime= 0.5mM			Oxime= 2.0mM			Oxime= 5.0mM		
A. Control	B(80)+AChE(100)+No POX			B(70)+AChE(100)+POX(0.1 μ M)			B(70)+AChE(100)+POX(1.0 μ M)			B(70)+AChE(100)+POX(10 μ M)		
B. 2-PAM	B(50)+AChE(100)+POX(10)+ 2PAM(20)			B(50)+AChE(100)+POX(10)+ 2PAM(20)			B(50)+AChE(100)+POX(10)+ 2PAM(20)			B(50)+AChE(100)+POX(10)+ 2PAM(20)		
C. Obidoxi	B(50)+AChE(100)+POX(10)+ Obidoxime(20)			B(50)+AChE(100)+POX(10)+ Obidoxime(20)			B(50)+AChE(100)+POX(10)+ Obidoxime(20)			B(50)+AChE(100)+POX(10)+ Obidoxime(20)		
D. 693-3a	B(50)+AChE(100)+POX(10)+ 693-3a(20)			B(50)+AChE(100)+POX(10)+ 693-3a(20)			B(50)+AChE(100)+POX(10)+ 693-3a(20)			B(50)+AChE(100)+POX(10)+ 693-3a(20)		
E. 693-3b	B(50)+AChE(100)+POX(10)+ 693-3b(20)			B(50)+AChE(100)+POX(10)+ 693-3b(20)			B(50)+AChE(100)+POX(10)+ 693-3b(20)			B(50)+AChE(100)+POX(10)+ 693-3b(20)		
F. 693-8a	B(50)+AChE(100)+POX(10)+ 693-8a(20)			B(50)+AChE(100)+POX(10)+ 693-8a(20)			B(50)+AChE(100)+POX(10)+ 693-8a(20)			B(50)+AChE(100)+POX(10)+ 693-8a(20)		
G. 693-8b	B(50)+AChE(100)+POX(10)+ 693-8b(20)			B(50)+AChE(100)+POX(10)+ 693-8b(20)			B(50)+AChE(100)+POX(10)+ 693-8b(20)			B(50)+AChE(100)+POX(10)+ 693-8b(20)		
H. 693-19a	B(50)+AChE(100)+POX(10)+ 693-19a(20)			B(50)+AChE(100)+POX(10)+ 693-19a(20)			B(50)+AChE(100)+POX(10)+ 693-19a(20)			B(50)+AChE(100)+POX(10)+ 693-19a(20)		

Figure 2: A typical well plate set up to screen for oxime conjugates. Some of the oxime small molecules that we narrowed our focus on were 693-3a, 693-3b, 693-8a, 693-8b, 693-19a, 693-19b, 693-70a, 693-70b, 693-29a, 693-29b, 693-29c, 693-29d, 693-29d, 693-77a, 693-77b, 693-77c, 693-77d, 693-77e, and 693-77f.

a buffer of pH 10.5 to the donor side, the exterior side of the skin, allowing it to equilibrate. We then remove the pH 10.5 buffer and add the paraoxon (a type of organophosphate) to the outer surface of the skin. We incubate the OP on the skin for 2 hours to allow for full deactivation of AChE. After the incubation, we add 300 microliters of the dendrimers to the top of the Franz cell. Once the dendrimers are added, we remove 50 microliter samples at indicated time points and add them to formic acid to quench the reaction. The usual time points used are at t=0 minutes, 6 minutes, 15, 30, 60, and 120 minutes. Ultra-Pressure Liquid Chromatography (UPLC) is used to separate small compounds into complex mixtures. Using UPLC analysis, we want to see the levels of activated POX decreasing over time. We expect almost 100% of POX at 0 minutes and deactivation of nearly all POX at 120 minutes. One way we measure this is by doing AUC, or area under the curve. The smaller the peak's area that shows up on the UPLC, the less POX remains. We also took samples of the pH 7.4 buffer on the receptor side of the skin to see how much of the POX went through the skin. This is also measured by UPLC. Next, a skin extraction is performed: we soak the decontaminated skin in ethanol overnight. The following day, a sample of the ethanol was removed and tested by UPLC to see how much POX and dendrimer remained in the epidermal and basal layers of the skin.

Results

Enzyme reactivation

We found that the higher the enzyme percent reactivity, the more effective the oxime is at cleaving the organophosphate from the active site. We expect to see higher reactivity at lower concentrations for the use of potential small molecule drug products.

In the graphs, we strive to see high enzyme reactivity, meaning that the dendrimer compound would effectively and efficiently deactivate the POX and reactive the enzyme. We see high enzyme reactivation in compounds 693-29f, 693-3b, 693-8b, 693-77c, and 693-77b (Figure 3). Not only were these molecules most effective but they showed the most consistency when the data was repeated. After addition of substrate, our pre-set Bioassay Plate Reader takes 25 absorbance readings in a span of 20 minutes. The kinetic rate of the enzymatic reaction is interpreted on a logarithmic scale. In Microsoft Excel, the initial slope is calculated for each oxime compound at various concentrations. Three data points are taken at each indicated oxime concentration; the average and standard deviation of the three absorbance values are calculated. Each 96-well setup contains a control row where no oxime is added (Figure 2). The first three columns

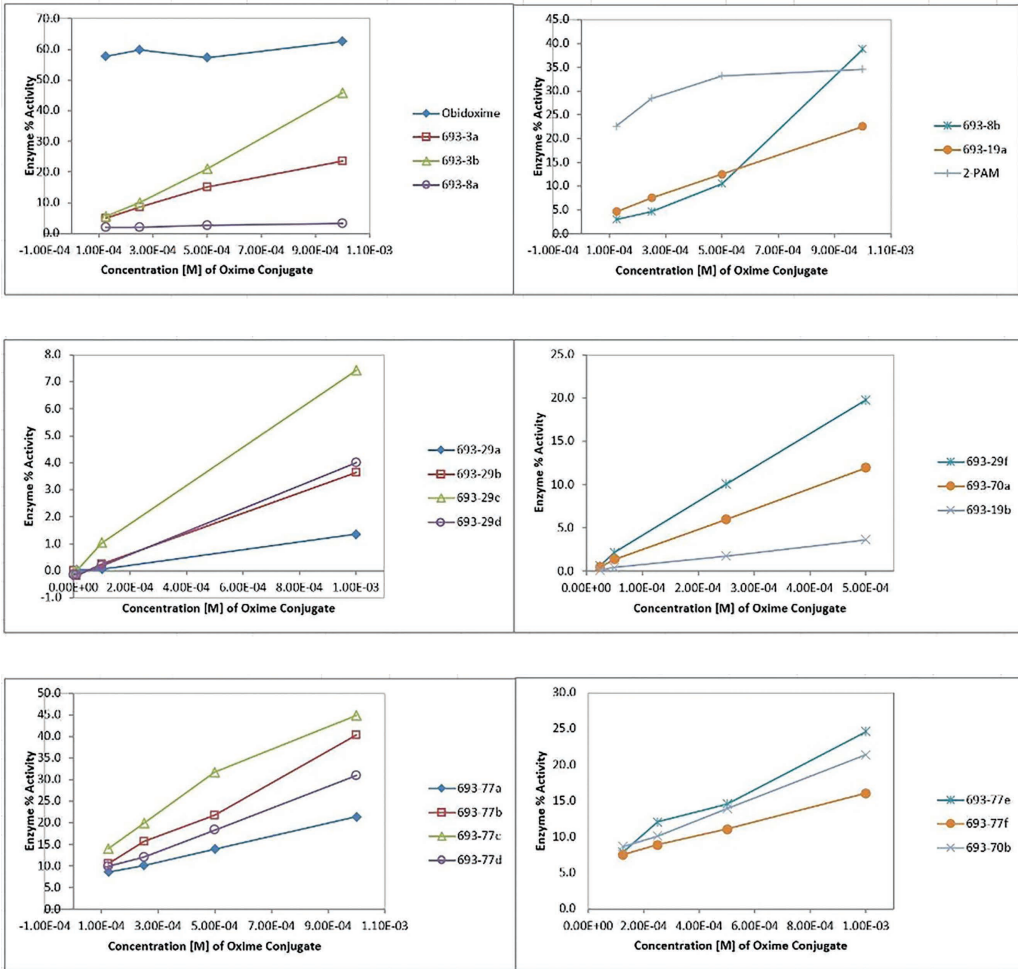


Figure 3: Results of 21 different oxime conjugates, two of which (Obidoxime and 2-PAM) are marketed products of OP poisoning. The data in these graphs come from plate assays using 96 well plates. On the x-axis, we have the concentration [M] of the oxime being added to the wells. On the y-axis, we have the percent reactivation of the enzyme calculated by the equation $100 \cdot [k - k(\text{inactive})] / [k(\text{active}) - k(\text{inactive})]$. 'k' is the mean reactivity of the enzyme or each conjugate, 'inactive' is a constant for when the enzyme is least reactive, and 'active' is a constant for when the enzyme is most active. Enzyme % activity is relative to the control.

of the control row contain no POX (wells A₁, A₂ and A₃), and the last three columns contain the highest concentration of POX (wells A₁₀, A₁₁, and A₁₂). Two averages of two slopes are found using these absorbance values: one is labeled "active" and the other "inactive." Setting $k = \text{slope}$, percent enzyme (re)activity is calculated using the equation: $\text{Enzyme \% Activity} = 100 \cdot [k - k(\text{inactive})] / [k(\text{active}) - k(\text{inactive})]$. The averages and variance values are then calculated for

each small oxime molecule at indicated concentrations. These averages are then plotted with concentration of the oxime conjugate on the x-axis and enzyme percent activity on the y-axis (Figure 3).

POX decontamination in porcine skin

The graphs shown below are results of UPLC (ultra-performance liquid chromatography) analysis for POX decontamination in the donor compartment of the Franz cell. In the skin decontamination experiment, our goal is to find a conjugate that will allow the least POX penetration through human skin.

Below is data collected from a UPLC of how long it took for POX to be fully inactivated on the surface of the porcine skin (Figure 4). The faster the dendrimer latches onto and deactivates the POX, the less likely the POX will penetrate through the skin to get into the bloodstream, meaning a lower toxicity level. The absorption unit (proportional to the POX remaining) was measured at 215nm and 275nm. The dendrimers eluted from the UPLC at a retention time of about 10.25 minutes, represented by the x-axis in Figure 4. An internal standard was used to calibrate the absorption unit of each dendrimer at the various time points (Absorption Unit is represented by the y-axis). The Area Under the Curve (AUC) was measured for each sample of each dendrimer pipetted from the Franz cells at various time points ranging from 0 to 120 minutes. Data taken by the UPLC are then transferred to an Excel spreadsheet where the results can be better displayed. As seen in Figure 4, the readings taken at 275 nanometers appear to show more sensitive results than those taken at 215 nanometers. The peaks on the graphs represent the remaining volume of POX on the apical side of the Franz cell. By adding the dendrimers, it is expected that the active form of the organophosphate will dissipate within 2 hours. The more ideal results would show a faster dissipation of the active form of POX. One example of an ideal candidate can be seen in the results 693-40A because there is no remaining POX after 1 hour of incubation with the dendrimer, whereas 706-8A is an example of a bad candidate because there continues to be traces of POX after 2 hours of incubation (Figure 4).

Discussion

As shown in Figure 3, the enzyme percent reactivity is consistently high at all concentrations of the 2-PAM and obidoxime. Our goal is to screen for an oxime molecule that shows high acetylcholinesterase reactivity especially at lower concentrations: if found, such an oxime would show high potency if used as the active pharmaceutical ingredient in a drug product. After about a year of

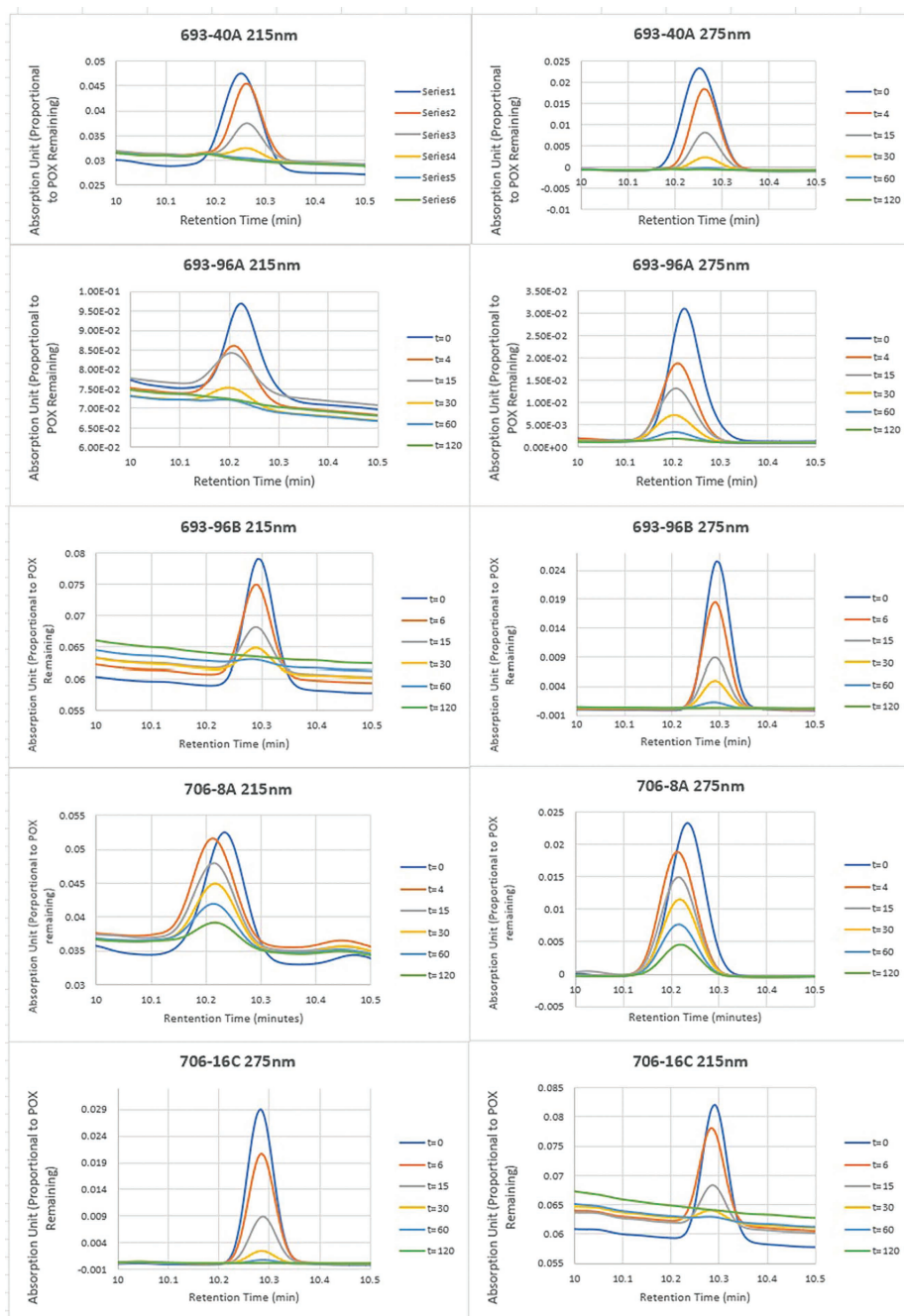


Figure 4: Ultra-Pressure Liquid Chromatography data taken at 215nm and 275nm for five different dendrimers. Time (t) is measured in minutes. Wavelengths 215 and 275 nanometers were used for the dendrimers because these wavelengths showed the best sensitivity of our analytes. 275 nanometers tended to show clearer “peaks” for most of our dendrimers compared to at 215 nanometers.

screening of the most effective oxime conjugates, we have decided to continue our investigations with 693-3b, 693-70a, 693-70b, 693-77a, 693-77b, 693-77c, 693-77d, 693-77e, and 693-77f. In the drug development process, thousands of compounds may be screened, but only a dozen or so make it to the preclinical testing phase. Moving forward, we will be using these oxime molecules in our preclinical studies. As hypothesized, we predicted that we would find promising oxime compounds via high throughput screening using enzyme assays.

As described in figure 4, the dendrimers 706-40a, 706-16c, and 706-96a most efficiently inactivated POX from the porcine skin during our Franz cell procedure. When analyzing the graphs, we notice in 706-8A that a large fraction of the POX remains in the porcine skin after 120 minutes (about 2 hours). Whereas 706-40A shows the complete removal of organophosphates from the skin after less than 60 minutes. If a person is poisoned by organophosphates, we want to make a topical substance that can be applied to the skin to destroy the POX, but not get into the bloodstream. Dendrimers are great for drug delivery, as they help enhance the permeability of the oxime conjugates by attaching them to the ends of the polymeric dendritic branches. Since there are many branches on these dendrimers, they can hold more oxime molecules per dendrimer, allowing for better delivery to the site of action. In the future, we hope to see comparable results when performing *ex vivo* and *in vivo* studies. Our approach is to make a topical cream to be used in the agricultural sector for dermal exposure to OP compounds. Although we do not plan to develop a product for organophosphate exposure via inhalation, we hope our findings can help advance the discovery of antidotes for inhalation exposure of OPs, including Sarin gas. We also strive to better understand the mechanistic action of our dendrimers, 706-16C, 706-40A, and 706-96A especially, our most effective compounds. We are beginning to transition from high throughput screening to preclinical studies using our results from our previous discoveries.

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THE IMPORTANCE OF INTERPRETERS IN THE MEDICAL SYSTEM

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“So, how are we doing today?” Dr. N walked into the exam room and sat on her stool as the accompanying registered nurse followed her and shut the door.

The nurse waited for the patient to finish speaking in Japanese, then turned back to the physician. “The patient said she’s experiencing chest pain.”

“Okay, let’s see what we can do.” Dr. N began a full body examination on the patient, lightly pressing into different areas of the patient’s chest and abdomen. When she reached the lower right area of the abdomen, the patient winced and recoiled.

“Ma’am, this is not your chest,” the physician said, pointing to the area she was examining. “Why did you say that you were having chest pain?” The patient turned back to the nurse with a puzzled expression. The patient was treated for appendicitis later that day.

Language and communication are important elements of healthcare that are often overlooked. Physicians who encounter language barriers when treating their patients should make better use of trained health care providers, but several obstacles stand in the way. Extra costs to the provider and patient, as well as administrative issues in organizing interpreter services, are the most common reasons that many medical practices fail to fully utilize these services (Brandl *et al.*, 2019). Considering the reported high demand for medical interpreters, interpreter agencies and services should be made more accessible to address linguistic and cultural barriers between providers and non-native patient populations.

Despite the need presented by immigrant and multilingual patient populations, physicians do not use professional interpreting services enough in

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their standard care plans. As globalization has caused populations across the world to become increasingly interconnected, it is imperative that those seeking healthcare in countries foreign to them are accommodated with regard to their language. Misinterpretation and limited communication could have detrimental outcomes for the patient and physician. For example, an article discussing the use of medical interpreters in American outpatient practices found that one out of forty medical malpractice lawsuits were at least partly related to lack of proper medical interpreter services (Jacobs *et al.*, 2018). Had the right personnel been present to facilitate discussions between the provider and patient, clinical mistakes would have been better resolved or may not have occurred at all. So why are physicians not making better use of the medical interpretation services in their practices?

In an online cross-sectional questionnaire-based study, 599 primary care physicians were asked to identify the main barriers obstructing them from using interpreter services in their practice (Jaeger *et al.*, 2019). The main barriers identified were (1) absent or limited financial coverage, (2) organization of interpreter services and (3) a lack of knowledge on how to arrange interpreter services.

With these barriers present, it is not surprising that physicians fail to incorporate more interpreter services into their practice. Physicians often have crammed schedules that leave little time for organizing these services or lengthening the time of visits to accommodate for interpretation. Furthermore, patients who are treated in trauma centers or emergency rooms often do not have the time to wait for an interpreter to be requested. The previously discussed study shows that doctors recognize that these barriers exist and that they require addressing, but there still remains a significant gap between understanding and taking action.

Current policies and pilot initiatives to improve access to medical interpretation in the United States healthcare system have either been unsuccessful or only temporarily beneficial in providing patients and physicians with services as needed (Jaeger *et al.*, 2019). The lack of nationwide provisions is partly due to the large state-to-state variations in policies and how funds and administrative assistance for these services are chosen to be distributed, if that. As of 2018, only fourteen states and the District of Columbia had policies in place to reimburse medical practices that used interpreter services for patients who used federally-funded insurance (Jacobs *et al.*, 2018). These policies are a step in the right direction, but are available in less than 30% of the states and limited to patients who are enrolled in Medicare or CHIP programs.

One of these fourteen states is Kansas, which was the focus of research conducted by Showstack *et al.* in 2019 to look at the state's policies and support for medical interpretation services, given its rapidly growing Latino population. Despite financial coverage and reimbursement for providers, the reviewed

policies did not list any competency requirements for the interpreters that are provided, leaving interpreter agencies to make their own guidelines. In order to be of great benefit to the patients and physicians, states must provide interpreters that are fully competent in medical terminology and also aware of cultural differences between patient and provider.

To improve relationships between patients, interpreters, and physicians, it is imperative that translator diversity, access to interpreters, and holistic training for both physicians and interpreters increase. Making these revisions to the current medical interpreter system would positively impact non-native patients' treatment and health outcomes. A review that examined the different outcomes of using trained medical interpreters found that a majority of studies showed an improvement in care and that additional costs are minimal compared to other healthcare expenses (Brandl *et al.*, 2019). Patients whose care was enhanced by proper medical interpretation made fewer future trips to emergency rooms and long-term costs for the patient were reduced. To have these outcomes be true for all patient populations, increased government funding and insurance reimbursement for training interpreters should be better implemented into the healthcare system.

In order to gain a better sense of how medical interpretation works and the implications it can have today, we interviewed Dr. N, an internist with over 25 years of experience. During the interview, Dr. N explained that she now often turns to Google Translate in her practice, since her nurse-interpreter was transferred from her private practice to the main hospital. Although the hospital she works for provides trained medical interpreters, Dr. N prefers the ease of using this software and the endless selections of languages, which meets the needs of her diverse patient population. Google Translate is the most accessible form of language translation since it is available on the internet, in hundreds of languages. If this and equivalent online translators were utilized in medical settings, there would be no need to hire and train interpreters in multiple languages. Furthermore, the cited financial barriers and funding issues would be eliminated since the software is free.

Similar to Dr. N, many physicians began turning to Google Translate when trying to deliver care in the presence of communication barriers. An algorithm update in 2017 to Google Translate proved to be promising as instructions for patients after emergency department visits were 92% accurate when translated to Spanish and 81% accurate when translated to Chinese (Khoong *et al.*, 2019). As long as sentences and instructions between the patient and provider are kept simple, there should be minimal issues in the translation program and clinically significant errors can be avoided (Miller, 2018).

Despite technological advancements, Google Translate's accuracy continues to be questioned. Miller *et al.* found that Google Translate is accurate about 9

out of 10 times in a medical setting, but that 10% of situations where mistakes occurred would be otherwise avoidable and at the expense of the patient (2018). Moreover, medical care cannot always be delivered in a few short sentences. Explaining complicated topics such as cancer diagnoses, therapy regimens, or medication names would not align with the simple-sentence model expected to be followed when using Google Translate. Words and phrases may not translate accurately, leading to further inaccuracies in the care delivered to the patient or the issues communicated to the physician. In these scenarios, physicians would have to use a medical interpreter or use other methods to communicate, such as writing instructions out or using pictures to describe treatment plans. Even studies as recent as 2019, which account for the aforementioned 2017 software update, recommend that Google Translate be used as a supplement to traditional medical interpretation and a warning about inaccurate translations be provided (Khoong *et al.*, 2019).

Translation software may be convenient and free, but it is also missing one of the most important elements of medicine: human connection. Dr. N frequently cited the importance of making patients feel comfortable and heard, despite language and cultural barriers that may be present. In fact, she stated “[as long as] you make them feel comfortable and relaxed, somehow you can communicate with them.”

Medical interpreters serve a crucial role in the healthcare system by bridging language and cultural gaps between patients and providers. Software programs could translate a doctor’s instructions verbatim, but doing so would lose the personalization required to communicate emergencies and instructions and empathize with the patient. Unlike trained interpreters, Google Translate and similar technologies do not see puzzled expressions, hear the pain in people’s voices, or ask if there are any more questions.

The medical and healthcare industries must work to create a space with palpable, comfortable forms of communication for patients who are non-native speakers. Whether it be through providing more funding for training and employing interpreters or starting programs similar to those of translating softwares, properly understanding the needs of a patient is a start to reaping more fruitful connections between the patient and physician, creating better interactions and outcomes for both groups of people.

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DO WE NEED MORE MIDWIVES IN OUR HOSPITALS?

AMBER BEILFUSS

The United States has the highest maternal mortality rate among developed countries and our intervention-based biomedical system is largely to blame (Hoyert, 2019). How can the United States significantly decrease this maternal mortality rate? Is it possible for our biomedical system to finally take a holistic approach to pregnancy in our hospitals? According to one study, the presence of midwives in hospitals leads to a significant decrease in preterm birth, surgical intervention and use of analgesic during pregnancy, as well as an increase in overall satisfaction of childbirth among women (Sandall et al., 2016). Despite carrying the burden of a high maternal mortality rate, the American medical system has yet to incorporate the help of midwifery into our hospitals on a large scale.

The approach of the midwifery model of health care has the potential to work alongside our current medical system as well as crucially improve it. For most pregnant women in the United States, the primary care provider during pregnancy is an obstetrician. Due to the hasty pace of most hospitals in America, pregnant women often do not receive the quality care that they should. However, a midwife is a trained professional that takes a holistic approach to pregnancy care, often treating pregnant women throughout pregnancy during labor, delivery, and even postpartum. A research study was conducted with 126 hospitals in New York. Out of those 126 hospitals, thirty-three had no midwife-attended births, fifty-five had 15% of births attended by a midwife, twenty-two hospitals had more than 15% attended by a midwife, and sixteen hospitals had more than 40% attended by a midwife (Attanasio and Kozhimannil, 2017). The research study concludes that the presence of more midwives in hospitals has decreased the rates of labor induction, cesarean birth, and maternal morbidity rates. Even with the large amount of evidence in the past ten years on the effectiveness of

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midwives in hospitals, the number of midwives in our hospitals is not nearly where it needs to be.

In addition to the effect that midwives have on maternal mortality rates in America, midwives also enhance the overall experience of childbirth for many women which is an equally important topic. Often, physicians will aim their focus towards the newborn during labor and delivery instead of the woman. A study to assess women's experience of childbirth, including components such as pain intensity, anxiety during labor, and feeling proud of themselves, showed that women receiving midwifery care during labor and delivery were more likely to rate their childbirth experience as more positive overall than women who did not have a midwife present (Sandall et al., 2016). This leads to high dissatisfaction outcomes for many American women across America during and after childbirth. Compared to other industrialized countries, access to midwifery care in hospitals in the United States is significantly lower; approximately 10% of US births are attended by midwives as compared to 50–75% in other industrialized countries (Saraswathi et al., 2018). In other countries such as France, Switzerland and Germany, the implementation of midwives alongside other medical care professionals, such as nurses and doctors, is a common service for reproductive, maternal, and neonatal health (Richter, 2020). In order to provide the best healthcare for pregnant women and to bring a holistic view of labor and delivery, health care professionals should be working together to decrease maternal mortality rates as well as surgical interventions. Additionally, a study conducted by the NIH contrasted women who gave birth at interprofessional medical centers (midwives and physicians) versus non-interprofessional medical centers. The results showed that women at interprofessional centers were 74% less likely to undergo labor induction. The cesarean birth rate was also 12% lower at these interprofessional centers (Neal et al., 2019).

Currently, we do not have any national funding regarding maternal and newborn health that incorporates the aid of midwifery into the healthcare system. Within a hospital, midwives are typically funded by insurance; usually this indicates that the midwifery practice is affiliated with that hospital (Dellos, 2017). However, the amount of insurance that covers midwifery care in hospitals varies by insurance type and the state you are in. According to the American College of Nurse Midwives (2014), 20% of insurance plans do not contract with Certified Nurse Midwives (CNM) and 17% do not fully cover primary care services by CNMs. As mentioned earlier, in France, implementation of midwives alongside other medical care professionals is a common service for maternal care. Compared to the United States where funding of midwives varies by the state, funding for midwifery care in France is defined at the national level by the Ministry of Social Affairs, Health, and Women's Rights and statutory health insurance (SHI) funds which are grouped under the National Union of Health

Insurance Funds. If midwives were to be 75–100% covered by insurance across all 50 states, the use of midwives in hospitals has the potential to increase significantly and thus reduce the maternal mortality rate in the United States (Hoope-Bender et al., 2014). Adjustments towards effective coverage of midwives in America would aid other healthcare providers in navigating heavy workloads in hospitals and increase the productivity of midwives and their care for pregnant women (Hoope-Bender et al., 2014).

Many patients may be reluctant to accept midwifery into their hospital labor and delivery care because of the different education that is required to become a midwife. To become a certified nurse midwife, individuals must earn a master's degree in nursing accredited by the Accreditation Commission for Midwifery Education. In some states, CNMs can work independently with their patients; however, patients may be more likely to accept an obstetrician over a nurse midwife for care. Expecting mothers may choose an obstetrician over a midwife because of common myths in the medical field such as “midwives cannot prescribe and administer pain medications” (UnityPoint Health, 2014). However, this is untrue and midwives are certified and capable of giving pain medications during birth. Another reason why mothers may choose an obstetrician is in the case of a high-risk emergency during the birth, midwives are not trained to do surgery by themselves (UnityPoint Health, 2014). However, midwives are able to assist in the surgery and provide support every step of the way. Thus, doctors that have to go through 8 years of training to become certified physicians may be more likely to be accepted by a patient as the primary care professional during pregnancy.

In short, the incorporation of midwifery care provides a new and holistic approach to care during pregnancy and childbirth. The significant impact of midwives on maternal mortality rates, surgical intervention during labor, delivery, and the overall childbirth satisfaction is too great to ignore. In the near future, I hope to see funding of midwifery care in the US at the national level rather than funding by state so that midwifery care is accessible to all mothers. Additionally, an increase in the number of midwives on our medical health care teams is needed for the overall satisfaction of birth among mothers and decrease in mortality rates in the United States. Our common goal should be to decrease maternal mortality and surgical intervention rates during childbirth, and midwives can help us do just that.

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IMAGING THE EFFECTS OF GLP-1 ON THE DEVELOPING PANCREAS

CHLOE RUSCILLI AND CORENTIN CRAS-MÉNEUR

GLP-1 (Glucagon-like peptide 1) is an incretin (a metabolic hormone modulating glucose metabolism) known to lower blood glucose by stimulating insulin release and inhibiting glucagon release. The effects of GLP-1 are well documented in adults, but little is known about the role of GLP-1 during development. The hypothesis of this project is that GLP-1 assists the pancreas in development, differentiation, and proliferation. To test this hypothesis, Glucagon-like peptide 1 receptor knockout mice (GLP-1R KO) were compared to control mice to block the mechanism of GLP-1. Sections of the pancreas were taken from both GLP-1R KO and control mice and were stained for insulin, glucagon, and proliferation. The data from the experiment suggests that GLP-1R KO mice have less islet cell mass (both α and β) and proliferation compared to controls. Further studies could investigate the role of GLP-1 during pancreatic organogenesis.

Keywords:

Pancreas, islet, β -cell, α -cell, diabetes, development, GLP-1

Introduction

GLP-1 (Glucagon-Like Peptide 1) is an incretin mostly secreted by intestinal epithelial endocrine L-cells lining the inside of the large intestine and the α -cells of the pancreatic islets (Whalley et al., 2011). It is secreted into the bloodstream in response to nutrients. GLP-1 travels through the bloodstream to influence many different organs in our body such as the brain, liver, and pancreas (Schematically represented in Figure 1) (Alejandro et al., 2014; D'Alessio et al., 1994; Drucker & Nauck, 2006; Smith et al., 2014). GLP-1 binds to a G protein-coupled receptor (GPCR) on the cell membrane.

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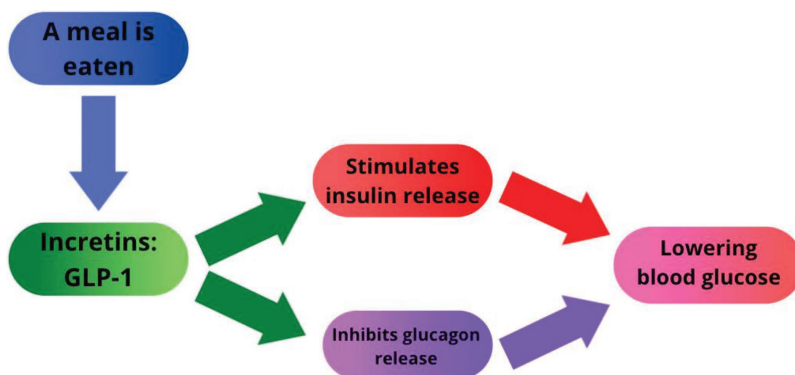


Figure 1. Pathway of GLP-1 and its effects on the body and pancreas.

The pancreas is composed of two main compartments: the exocrine tissue (acinar cells and ducts), which represent about 80% of the pancreas, and endocrine tissue, highly vascularized and regrouped into islets of Langerhans embedded within the acinar cells, representing 2–3% of the pancreas. The exocrine cells secrete digestive enzymes, and the endocrine glands secrete hormones into the bloodstream, mostly to regulate blood glucose levels. There are five types of pancreatic islet cells: α -cells secreting glucagon, β -cells secreting insulin, δ -cells secreting somatostatin, PP cells secreting Pancreatic Polypeptide, and ϵ -cells secreting Ghrelin.

In the adult, GLP-1 is known to stimulate insulin secretion, inhibit glucagon release, and has a role in β -cell survival, targeting pathways known to regulate pancreatic development (Alejandro et al., 2014; Cras-Méneur et al., 2016; Cras-Méneur et al., 2002; Elghazi et al., 2017; Elghazi et al., 2017; Elghazi et al., 2002; Light et al., 2002; Talchai et al., 2015; Thorens et al., 1996; Villanueva-Peñacarrillo et al., 2001). This shifts the body to anabolic processes and lowers blood glucose.

Diabetes is a chronic health condition that affects how the body turns food into energy. There are two different types of diabetes. Type 1 occurs when the body's immune cells attack the β -cells in the pancreas. This can destroy all the β -cells causing the pancreas to be unable to secrete any insulin or deplete the amount of β -cells causing the inability to produce sufficient amounts of insulin in response to a meal. Type 2 diabetes results when the body is not able to provide enough insulin to adequately lower blood glucose. Typically, type 2 diabetics have become insulin resistant, and their β -cells fail to adapt to the increased demand for insulin. GLP-1 has been used as a pharmacologic treatment for Type 2 diabetes because of its ability to increase insulin secretion and limit β -cell death. (Alejandro et al., 2014; Cras-Méneur

et al., 2016; Cras-Méneur et al., 2002; Elghazi et al., 2017; Elghazi et al., 2017; Elghazi et al., 2002; Light et al., 2002; Talchai et al., 2015; Thorens et al., 1996; Villaneuva-Peñacarrillo et al., 2001).

While the effects of GLP-1 in adults have been extensively studied, few studies have addressed its impact on pancreatic development (Elghazi et al., 2017; Elghazi et al., 2017; Elghazi et al., 2002; Gromada et al., 1997; Light et al., 2002; Millamn et al., 2016; Pagliuca et al., 2014; Schindelin et al., 2012; Smith et al., 2014; Sun, X, & Kaufman, 2018; Talchai et al., 2015; Thorens et al., 1996; Villaneuva-Peñacarrillo et al., 2001). This project aims to investigate whether GLP-1 could affect the developing islets in the pancreas during embryonic development. To target GLP-1 signaling during development, we used mice that have a deletion of the GLP-1 receptor and are therefore insensitive to GLP-1 itself.

Based on the effects of GLP-1 in the adult, we hypothesize that mice without GLP-1 receptors would have decreased islet cell mass and reduced proliferation. As illustrated in Figure 2, different key developmental stages were studied in order to narrow down the role of GLP-1 during the early steps that control the endocrine fate, or the maturation of β -cells. If there is no difference between pups with GLP-1 receptor and without the GLP-1 receptor, we expect to see no difference in mass nor proliferation of cells.

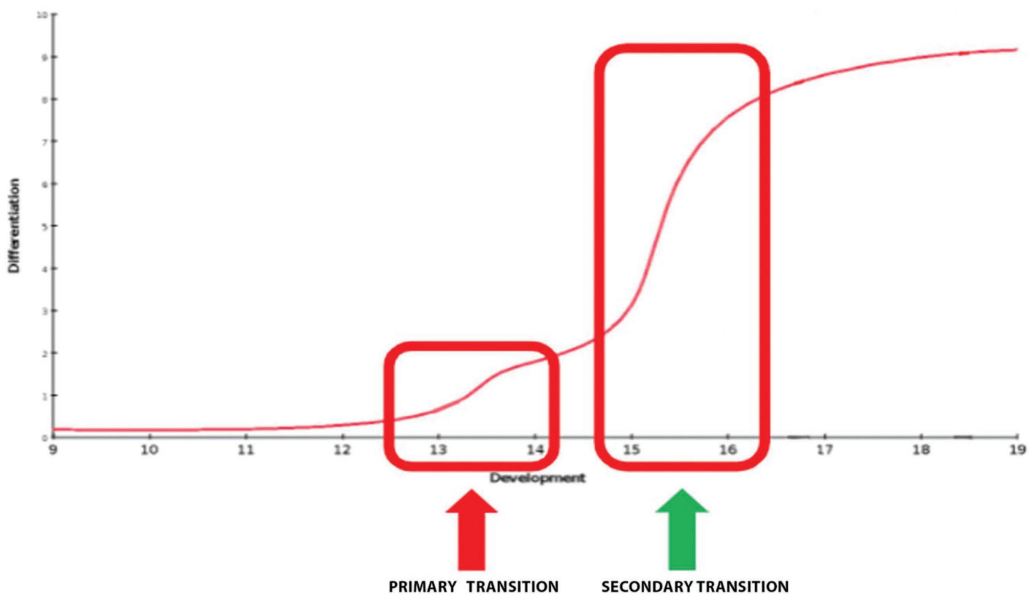


Figure 2. Measuring amount of differentiation throughout mouse pancreatic development (days). The primary and secondary transitions in development are highlighted with red and green arrows, respectively.

Methods

Immunostaining

The project is centered on the analysis of the pancreatic phenotype of transgenic mice models. After newborn pancreatic dissection, the tissue is fixed, paraffin embedded and sectioned. For staining, the slides are deparaffinized and rehydrated before staining with different specific primary antibodies. The antibodies are chosen to target specific proteins in the pancreatic islets (e.g., Insulin, Glucagon, or Ki67 for proliferation quantification). A secondary antibody with a fluorophore allows us to visualize the staining in the islets under a fluorescent microscope. Primary antibodies are diluted in a blocking solution which prevents the antibodies from binding to any non-specific antigen. Slides are incubated with the antibody overnight at 4°C. After a series of washes, the secondary antibody (also diluted in blocking solution) is incubated for 2 hours at room temperature. After additional washes, the slides can be mounted with a glass coverslip using an anti-fading mounting solution and kept in the refrigerator until image acquisition. If scanning for proliferation, a DAPI counterstain is used when mounting the slides on glass. The DAPI counterstain allows us to stain the nuclei in blue.

Image Acquisition

Image acquisition is done with a fluorescence microscope with a motorized stage (Nikon AZ-100). Pictures are taken in three separate color channels (green, red, and blue) with a cooled monochrome camera with high bit depth. FITC secondary antibodies are used to stain green, Cy3 for red, and the DAPI counterstain for the blue channel. In our experiments, FITC was used for insulin in the β -cells in the pancreatic islets. Cy3 was used for either glucagon in the α -cells of the islets or for Ki67 (a proliferation marker) and DAPI provided a blue counterstain for the nuclei.

Morphometric Analysis

As previously described, after the images are captured on the microscope, they are further processed using Fiji, an image processing software used for morphometric analysis of the images (proliferation, β - and α -cell mass) (Cras-Méneur et al., 2016; Elghazi et al., 2017; Elghazi et al., 2017; Schindelin et al., 2012). To determine β -cell mass, Fiji is used to outline the boundaries of the pancreas and eliminate extraneous material in the photo. Next, the threshold feature is used

to highlight the tissue and quantify the area of insulin positive staining of the pancreatic section. The β -cells are outlined using the insulin staining in the green channel and use thresholding to get the area of the β -cells. The same process is followed for α -cells in the red channel.

The total area of the α - or β -cells can be divided by the whole pancreatic area to calculate the percentage of the pancreas that consists of β - or α -cells. The proportion of staining and the whole pancreas weight allow for the determination of the mass of the corresponding cell type. Proliferation is measured using the Ki67 stain. Ki67 is used to measure proliferation because it is exclusively expressed during interphase of mitosis, and it binds to DNA. Ki67 is not present in G₀ cells, but is expressed in G₁, G₂, S and M phase (Sun, X, & Kaufman, 2014). Ki67-expressing nuclei can be automatically counted in Fiji using different plugins allowing to reinforce contrast using Limited Adaptive Histogram Equalization (CLAHE) and identify the nuclei based on their sizes, roundness, staining intensity, and distance from one another using segmentation through an additional plugin (ITCN <https://imagej.nih.gov/ij/plugins/itcn.html>) (Zuiderveld, 1994). The percentage of proliferation was found in the pancreas through the ratio between proliferating cells expressing Ki67 in red and the total number of nuclei counterstained with DAPI in blue. This also allows examination of β -cell proliferation. This can be achieved by outlining the β -cells in all three channels based on the insulin staining and deleting the surrounding material. The blue channel and nuclei counter help determine the total number of nuclei in the β -cells and the red channel is used to determine which cells are proliferating within the β -cells.

Because the binomial distribution of the data could not be demonstrated, the data was analyzed using nonparametric tests (Mann Whitney) using the statistical analysis software Prism 9 (Graphpad Inc.). Prism was used to plot data and compare the differences between GLP-1 knockout mice and GLP-1 mice at different stages of the development and at birth.

Results

Reduced α - and β -cell mass in GLP-1R KO mice at birth

The data gathered for this experiment involved pancreatic sections 4 μ m thick from five mice. Data was collected from 5 independent pancreatic sections. Sections were stained for insulin, glucagon, proliferation (Ki67), and nuclei (DAPI). Sections were isolated, stained, and analyzed for these factors to determine the role of GLP-1 during development. β - and α -cell mass is determined by isolating the cells and determining their mass relative to the entire section. The CLAHE

GLP-1R KO (*GLP-1R Stop-flox*) New Born

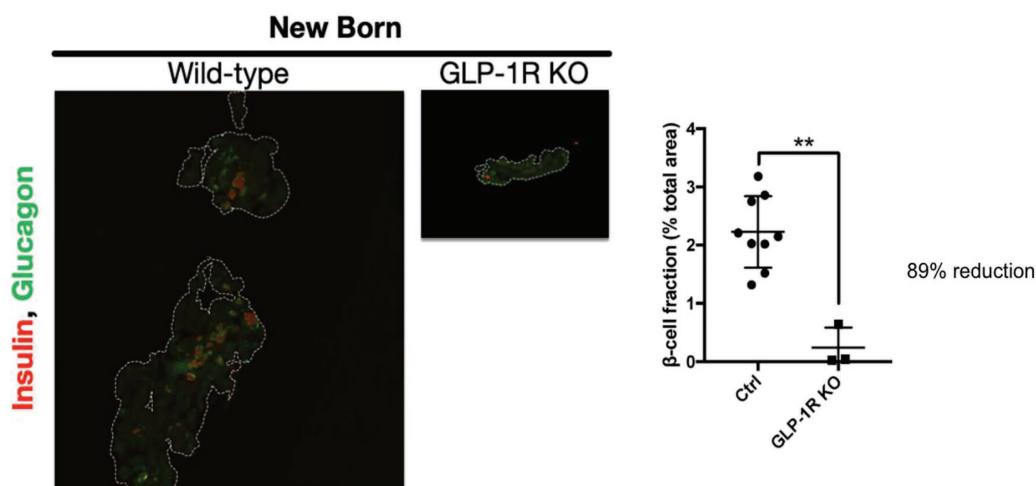


Figure 3. Expression of insulin and glucagon in wild type and GLP-1 KO mice. Pancreatic slices from newborn wild type (WT) and GLP-1 receptor knockout mice (GLP-1R KO) were obtained and stained with Cy3 antibodies for glucagon, shown in red, and FITC antibodies for insulin, shown in green. Average percentage of β -cells across sections of control (WT) and GLP-1 KO mice. (** $P < 0.01$)

tool is used to determine proliferation in the blue and red channels to count the number of proliferating nuclei.

The pancreas sections for the GLP-1R KO mice on average were much smaller than sections for the wild mice. There was also more fluorescence in the wild type mouse and more cells stained positive for insulin and glucagon. Figure 3 which shows that there is an 89% reduction in β -cell fraction in GLP-1R KO mice. The difference in size could constitute for the higher expression of β -cells in the wild type mouse. Differentiated β -cells release insulin which we can measure through immunostaining. Since the GLP-1R KO mice have less β -cell mass, the results suggest that GLP-1 has a role in differentiation and growth of the pancreas.

Overall α -and β -cell proliferation is also reduced in KO mice

The wild type mice appear to have more red staining, indicative of Ki67, a marker of proliferation. The wild type mice have an increased percentage of positively stained cells which indicates that they have increased proliferation in islet cells

GLP-1R KO (*GLP-1R Stop-flox*) New Born

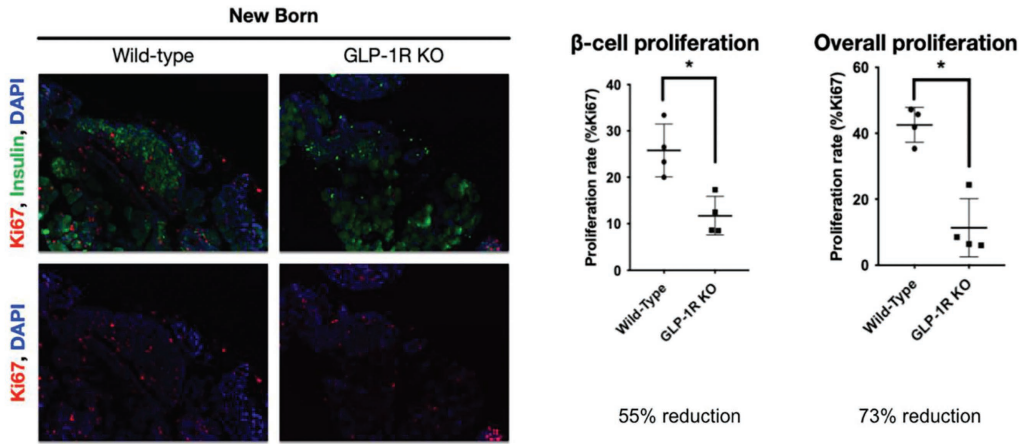


Figure 4 . Expression of proliferation, insulin, and nuclei. Pancreatic slices from newborn mice were stained for proliferation (Ki67), nuclei count (DAPI), and insulin (FITC). Average β -cell proliferation and overall proliferation across wild type and GLP-1R KO mice is shown in the graphs. (* $P < 0.05$)

(Figure 4). This indicates that the GLP-1R KO mice have less β -cell proliferation as well as less overall proliferation. This result shows that pancreatic cells in KO mice are not dividing as often and can account for the smaller size of the pancreas seen in Figure 1. GLP-1R KO mice are shown to have less pancreatic growth and islet cell concentration in comparison to their control counterparts.

The gathered data demonstrates that the GLP-1R KO mice exhibit less proliferation and reduced overall islet cell mass (both β and α) than their control counterparts at birth. The fewer number of cells could be due to reduced proliferation or increase apoptosis.

Discussion

These findings suggest that the GLP-1 protein has a role in the development of the pancreas. Considering the smaller size, decreased proliferation, and decreased islet mass in both α and β - cells, GLP-1 seems to be involved in development at birth. Concomitantly, both α - and β -positive cells were drastically reduced in the GLP-1R KO mice compared to the control, therefore increasing the deficit in islet mass at birth. The mass of the pancreas itself was less in the GLP-1R KO mice as well. The proliferation rate was also lower, suggesting that the GLP-1 protein has a role in pancreatic growth and differentiation during development, resulting in

reduced mass and differentiation at birth. Further analysis will need to be performed to find out the exact timing GLP-1 is acting during development.

As a newborn, a glucose tolerance test is impractical, but due to decreased mass, we can anticipate that insulin and glucagon secretions might be impaired in these animals after birth. Further studies could block the GLP-1R on specific cells in the islets to determine if a certain type of cell in the pancreas has a larger role in development and differentiation. This research could investigate if GLP-1 has a role in paracrine signaling. The paracrine effect is the process by which one cell influences the differentiation of another nearby. Another potential direction for research could be investigating the effect of GLP-1 on cell differentiation. Islet cells can differentiate into either α -, β -, δ -, ϵ -, and PP cells. Differentiation is a key part of development, and this research could further uncover the function of the GLP-1 protein.

It is hypothesized that GLP-1 assists in the differentiation of pancreatic cells during organogenesis. Further studies at key embryonic stages (see Figure 2) could determine whether GLP-1 could affect pancreatic mass by altering the proliferation or the differentiation of the progenitors. This hypothesis could be studied by culturing pancreatic progenitor cells in the presence and absence of GLP-1. Cells can be marked for proliferation with Ki67. If proliferation of pancreatic progenitors is equal across conditions, then GLP-1 does not play a role in proliferation of progenitors. It is also possible that GLP-1 absence could be decreasing the endocrine mass of the pancreas by reducing differentiation of islet cells. In a similar setup, progenitors can be cultured with and without GLP-1. Cells can be stained for determinants of differentiation, such as staining for insulin in β cells. Studies of this type are limited because of the α -cells ability to secrete GLP-1. To account for this, future studies could genetically modify mice and delete the genes coding for secretion of GLP-1. The results of this study can give researchers important information on pancreatic development with GLP-1 and can help make strides towards the therapeutic treatment of diabetes that could further be adapted for the in vitro differentiation of embryonic stem cells towards β -cells (Millman et al., 2016; Pagliuca et al., 2014).

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REINTERPRETING GENERAL DE GAULLE: NATIONALIST OR REALIST?

JIAHAO YANG

In the 1960s, the integration progress of the European Community into a more economically and politically connected coalition stagnated for a long time. The majority of current literature attributes the continuing deadlock to Charles de Gaulle's personal sentiment against the European Grand Design, but does not take France's global status into consideration. This paper argues against this view and explains de Gaulle's realist ideology underlying his international actions using the geopolitical perspective of the internal relations within the Western bloc during the Cold War Period. By intensively discussing France's complex relations with the United States, Benelux, and Germany, the current paper aims to reinterpret de Gaulle in the field of foreign policy and will attempt to explain why the realist understanding of de Gaulle was more in line with the contemporary geopolitical conditions.

In 1965, Walter Hallstein attempted to introduce the European Community's own financing plans and incorporated qualified majority voting (QMV) into the Community's decision-making process, which might have given rise to further integration of the Six (France, Western Germany, Italy, Netherland, Belgium, Netherland, Luxemburg). However, General de Gaulle instead responded by withdrawing representatives from the Council of Ministers to protest against the provocative policy of expanding the Community's supranational power, which resulted in the Empty Chair Crisis, marking the beginning of a sustained stagnation in the integration dynamic. The existing literature is divergent in understanding the reasons why de Gaulle disfavored further integration under the threat of eastern communism throughout his rule. Some attribute his efforts to his personal dislike of the supranational Union or his narrow nationalist attitude, explaining his actions through the lens of *grandeur* or Frankish national faith. On the contrary, other scholars describe de Gaulle's foreign policy in the

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framework of political realism and portray de Gaulle as only “concerned with their own security and act in pursuit of their own national interests.”¹ By intensively discussing France’s complex relations with the United States, Benelux, and Germany, the current paper aims to reinterpret de Gaulle in the field of foreign policy and will attempt to explain why the realist understanding of de Gaulle was more in line with the contemporary geopolitical conditions.

Existing literature is rich in analyses of de Gaulle’s foreign policy ideologies. For example, international relations scholar Thomas Risse writes that “de Gaulle re-introduced the notion of French exceptionalism and uniqueness in terms of a civilizing mission for the world (mission civilisatrice).”² Here, Risse claims that de Gaulle’s actions in the context of the Cold War was essentially due to his belief in the French mission, which was to revitalize Frankish nation and culture all the way back to Charlemagne. Risse also argues that de Gaulle wanted to *demonstrate to the world* that the Franks were able to act in independence and in eminence.³ Hence, authors in this faction mainly uphold the notion of narrow nationalism, portraying France as a global player actively seeking spiritual independence and the revitalization of Frankish images. On the other hand, global affairs professor Philip G. Cerny at Princeton concludes that de Gaulle’s intent was to “escape from the Cold War ideological structure and to replace it with a structure based upon national realities.”⁴ In addition, Martin argues that de Gaulle’s philosophy puts nations and countries above ideology and prioritizes political realities.⁵ Therefore, the literature of this faction depicts de Gaulle as a traditional realist concerned with France’s own security, interest and power.⁶ This paper advocates for Cerny and Martin’s argument and further explores why de Gaulle was a traditional realist in a geopolitical perspective and how this principle was arguably reflected in his diplomacy strategies.

De Gaulle’s geopolitical considerations were exemplified by the fact that France’s disengagement with the Community integration was mainly due to France’s conflict with the United States, who had been deeply involved in the Community since the establishment of the Marshall Plan in 1948. The dispute

1. Włodzimierz Julian Korab-Karpowicz, “Political Realism in International Relations,” *The Stanford Encyclopedia of Philosophy* (Summer 2018 Edition), Edward N. Zalta (ed.), URL = <<https://plato.stanford.edu/archives/sum2018/entries/realism-intl-relations/>>.

2. Thomas Risse, Nationalism and Collective Identities: Europe versus the Nation-State?, *Developments in west European politics*, 2 (2002), 89.

3. Garret Martin, “Playing the China Card? Revisiting France’s Recognition of Communist China, 1963–1964,” *Journal of Cold War Studies* 10, no. 1 (2008): 52.

4. Philip G. Cerny, *The Politics of Grandeur: Ideological Aspects of De Gaulle’s Foreign Policy* (London: Cambridge University Press, 1980), 150.

5. Martin, 80.

6. Andrew Moravcsik, “Charles de Gaulle and Europe: the new revisionism,” *Journal of Cold War Studies* 14, no. 1 (2012): 54.

began in 1956 when the Suez Canal Crisis started brewing, and the United States repudiated France's and Britain's initiative against Gamal Abdul Nasser, the Egyptian president under the Soviets' support. Americans' timid response toward the Soviet threats and the subsequent withdrawal request regardless of France's share in the Suez Canal Company demonstrated that Washington prioritized easing small disputes over the vital interests of its smaller allies such as France. In addition, Frédéric Bozo argues that the establishment of nuclear arsenals and even Sputnik heightened the potential cost of confronting Moscow and strengthened this belief.⁷ Even though Washington, as claimed, reserved the ability to protect allies through nuclear means, Anglo-Americans only agreed to hand over the nuclear control in the case of emergency as opposed to directly putting it under the command of Quai d' Orsay (French Ministry of Foreign Affairs) for the sake of forestalling "the risks of proliferation" in the continuing negotiation from 1959 to 1962.⁸ In general, the ambivalent attitudes of Americans towards the Soviets' nuclear deployment "diminished the plausibility" of a large-scale reaction by Washington if Moscow launched an attack on Western Europe.⁹ This speculation was not without evidence and was supported by the fact that the potential nuclear war was becoming more and more destructive to France, but not to the United States.¹⁰ Hence, de Gaulle felt that "the defense of Europe was a burden" for the United States, a burden she would not like to bear.¹¹ For these reasons, de Gaulle had been loudly dissociating himself from the supranational Community and thereby demonstrating French's independence in the realm of foreign policy without consulting the United States.¹² Similarly, de Gaulle claimed in May 1962, the French goal was to "defend itself," and "an integrated Europe would . . . remain tagging behind America."¹³ So, by stepping out of further integration, France could counterbalance the Soviet clout and thus minimize potential losses through its own means by diverting more maneuverability towards taking the lead among or seeking a mutual understanding with non-Westerners, or at least lowering the possibility of minor aggression from the Eastern hegemon without looking upon the "hypocritical" guarantee of the United States.¹⁴ Therefore, de Gaulle's strategies toward America and France's own defense could essentially be understood as negative nationalism, a realistic

7. Frédéric Bozo, *Two Strategies for Europe: De Gaulle, the United States, and the Atlantic Alliance* (Lanham: Rowman & Littlefield Publishers, 2002), 4.

8. *Ibid.*, 62

9. *Ibid.*, 4.

10. Cerny, 192.

11. Marc Trachtenberg, "The de Gaulle Problem." *Journal of Cold War Studies* 14, no. 1 (2012): 85.

12. W.W. Kulski, *De Gaulle and the world: the foreign policy of the fifth French Republic* (New York: Syracuse University Press, 1966), 34.

13. Bozo, 80.

14. *Ibid.*, 168.

reaction to American indifferences and lack of full guarantee, rather than a positive nationalism or grandeur, that puts national ideals over other geopolitical calculations.

As mentioned earlier, political realism was shown in France's interaction with the Community, while this type of strategy was particularly evident in the relation with Benelux. France's tie with Benelux countries was defined as interdependence, ambiguity, and animosity, which was especially clear in the negotiation of the Fouchet Plan from 1961 to 1962: de Gaulle aimed to empower Europe with independence in foreign affairs with a view of putting "an end to American integration,"¹⁵ while the prospect of the intergovernmental design led Benelux to see the Fouchet Plan as potential economic disintegration, as well as a Frankish tool to challenge Anglo-American leadership in NATO.¹⁶ Dutch Foreign Minister Joseph Luns notably voiced strong opposition and stressed British accession as the prerequisite for agreeing upon the terms in order to dilute Franko-German dominance.¹⁷ Overall, as de Gaulle was calling for a united and autonomous Western Europe, Benelux leaders' "insincerity" in the disapproval of the failed design frustrated de Gaulle and made the conflicting interest clearer than ever.¹⁸ As especially manifested in the Fouchet Plan, this type of geopolitical interest misalignment between Benelux and France convinced de Gaulle to cease further cooperation with the Community from 1963 to 1969, which explained the long-term stalemate at almost all segments of the Community and de Gaulle's refusal after the Fouchet failure to join the formal meetings as institutionalized by pre-approved treaties, such as Meetings of EC heads of government and the Community's quarterly meetings of foreign ministers.¹⁹ In sum, for France itself, extricating from Washington's grip denoted greater freedom in foreign policy to make up for Americans' insufficient guarantee of protection and retaliation in case of nuclear attack. However, for Benelux, the Fouchet plan merely meant to turn their master towards France, a less reliable ally, while potentially upsetting the United States and lessening the chance of a massive American response to the communists' aggression. As a representative of political integration attempt, the Fouchet Plan negotiation uncovered the inherent geopolitical conflict between Benelux and France, a reality that appeared to be true throughout de Gaulle's rule, caused his skepticism of the whole integration, and led to France's alienation from European Design throughout the decade.

15. Jeffrey Vanke, "An Impossible Union: Dutch Objections to the Fouchet Plan, 1959–62," *Cold War History* 2, no. 1 (2001): 97.

16. *Ibid.*, 97–99, 108.

17. *Ibid.*, 104.

18. Cerny, 210.

19. Anthony Teasdale, "The Fouchet Plan: De Gaulle's Intergovernmental Design for Europe," *LEQS Paper* 117 (2016), 52–53.

For de Gaulle, neither did West Germany seem to be a reliable ally, which speaks to de Gaulle's strong objection against Community supranational expansion in a traditional realistic sense. The European Community essentially revolved around the France-Germany axis, so the German-American relations defined the Six (Belgium, France, Italy, Luxemburg, Netherland, West Germany) as either the satellites of the United States or as independent entities between the superpowers. Just as Charles de Gaulle vetoed the UK accession in 1963 and 1967, the close US-Germany tie might have arisen the same concern of "Anglo-American Trojan horse," making his aspiration of Europe being an independent third power an unfulfilled illusion. A geopolitical reality substantiated the failure of de Gaulle's aspiration: Germany's defeat, west-east division, as well as its long shared border with the Soviets limited her decision and conditioned her survival and prosperity primarily on alliance with the United States.²⁰ Only through the framework of NATO could Bonn (capital of West Germany) maintain her global engagement after the historic defeat,²¹ and her fear of the potential encroachment of the Soviets combined with French incompetence made the Atlantic Alliance with Washington the only "true guarantee of their [Germans] security."²² In other words, "Germany could not afford monogamous marriage with France."²³ For these reasons, De Gaulle believed Bonn's close contact with Washington and distrust of the French ability to protect West Germany nearly *offset* the French-German pact (which started with the European Coal and Steel Community from the Schuman Plan when France intended to limit German power while neutralizing the American-German intimacy at the same time) and pulled the European Design away from the claimed third power between the superpowers to the Atlantic Alliance under Anglo-American leadership. Therefore, the internal division between the two founders of the Community made it clear that the full commitment to the Six was an unfavorable choice for the French in a realistic sense. Deep involvement in the French-German agreement meant binding her decisions and placing France under the discretion of the United States. On the contrary, looking outward grants a significant degree of freedom to take the initiative to reduce the external threat on her own instead of counting on the unreliable neighbor.

Some pre-existing literature refers to de Gaulle's strategies as the policy of grandeur, which means to pretentiously demonstrate foreign policy independence, showcase Frankish power, and restore France's national pride dating back to its colonial past. Just as Cerny argues, the purpose of establishing a conspicuous presence in places other than the European continent was to show France's

20. Cerny, 163.

21. Bozo, 51.

22. W.W. Kulski, "De Gaulle in International Affairs," *The High School Journal*, 49(3), 141.

23. Ibid.

ambition to play a vital role in the world, if not as prominent as the United States and the Soviets Union.²⁴ However, the reality was far from the spirits manifested in de Gaulle's memoir *France cannot be France without greatness*²⁵ due to Quai d'Orsay's grave and embarrassing situation in the face of the increasingly aggressive Soviets, intensifying global dichotomy, and the impending nuclear attack.

As discussed earlier, the United States' uncertain stance on nuclear retaliation, Benelux's fear of France's dominance, and Germany's thirst for re-engagement with the world forced de Gaulle out of his plan and instead sought strategic independence. Similarly, the nationalistic rhetoric does not take one issue into account, which is that de Gaulle handed off the agricultural aspect of state sovereignty in exchange for the alluring benefit of the Common Agricultural Policy (CAP). The enormous CAP agricultural subsidies, which entered into force by the 1957 Treaty of Rome, lured Quai d'Orsay to make a concession and consider supranational possibilities in this sector, which it would otherwise disfavor.²⁶ Likewise, we might not assume that de Gaulle would firmly cling to his nationalistic stance had the geopolitical realities discouraged him from doing so. It is rather to believe that de Gaulle could and was willing to reverse his "nationalistic disguise" when giving into French national sovereignty brought colossal benefits or helped avoid risks.

The term "nationalist" implies that de Gaulle, or France, still retained a variety of choices at his considerations while determining to oust Walter Hallstein in 1965 in the Luxembourg Compromise in order to safeguard national sovereignty and so-called *grandeur*. However, under the direct threat of the Soviets and nuclear risk, it was unlikely that France still had a backup option in foreign policy that did not put Frankish fundamental interest in danger during the 1960s. This limitation and her lonely presence in Europe mandated Quai d'Orsay to seek support elsewhere other than the European Community and Washington, pushing de Gaulle toward the recognition of China in January 1964, Latin America in September 1964, and reconciliation with Eastern Europe countries to "avoid competition in these parts of the world."²⁷

Overall, it was not *grandeur* or national pride but the realistic necessities that guided de Gaulle's international activities. As China's eyes turned inward in 1966 due to the Cultural Revolution, Latin American countries dragged to the American side from the 1960s to 1970s, and the relation with Moscow improved

24. Cerny, 203.

25. Adrian Waters, Charles De Gaulle and his "Europe of Nations" – Theory and Practice. Institute for a Greater Europe. <https://institutegreatereurope.com/2019/06/25/charles-de-gaulle-and-his-europe-of-nations-theory-and-practice/>.

26. John T. S. Keeler, De Gaulle and Europe's Common Agricultural Policy: The Logic and Legacies of Nationalistic Integration. *French Politics and Society* (1990), 62–77.

27. Kulski, *De Gaulle and the world*, 168.

over time,²⁸ Charles de Gaulle's international layout "splintered along social, economic, and political fault lines."²⁹ It was only when these previous geopolitical assumptions were no longer valid that de Gaulle started to reconsider his last resort, namely, Western Europe, in responding to the new international realities. Just as de Gaulle Atlantic policy softened somewhat after May 1968,³⁰ we might have seen his policy progress on this trend and strengthening the supranational European Grand Design in the same way as his successor Georges Pompidou (who endorsed the EC's own financing and improved its supranational function) in the 1970s even if de Gaulle extended his term to the next decade.

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28. *Ibid.*, 297.

29. Bozo, xi.

30. *Ibid.*

REIMAGINING

BILAL IRFAN

ہم دیکھیں گے

This paper investigates Pakistani writer Faiz Ahmed Faiz's famous poem, ham dekhenge. In recent times, it has become a source of controversy for the language utilized and the Islamic-themes oriented within it, as seen by coverage surrounding the Citizenship Amendment Act protests in India in 2019. Building upon the sayings of literary commentators, this research dwells onto the Qur'anic and Şufi origins for this poem, as well as its distinctly anti-colonial nature. It investigates the relationship with Faiz's Marxist leanings, the evidently Pan-Islamic motif, and the original context of the poetry as a source of defiance to Zia ul-Haq's regime in Pakistan by its famous singing by Iqbal Bano in 1986.

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REIMAGINING HAM DEKHEÑGE

Introduction on the Faizite essence

The rebirth of Urdu literature in the second half of the 19th century until the end of the Cold War can be attributed to the momentum spurned out by one legendary figure, Shamsu'íl-'Ulamā' Maulvī Syed Mīr Ḥasan. He was the teacher of Muhammad Iqbal, who was posthumously honored as the national poet of Pakistan for the religious rebirth he gave to Indian Muslims. Yet he also served in another more distinct capacity, as the Arabic and Persian teacher to Faiz Ahmed Faiz. Faiz grew up in a middle-class family from Sialkot, Punjab and was schooled in the literary traditions of English, Urdu, Arabic and Persian as was customary to advancing figures in the social sciences in the post-Mughal era. Without a doubt, Faiz's upbringing instilled a unique appreciation for the Indo-Persian, Perso-Arabic, and Turkic traditions that were found within mainstream sensibilities of classical Urdu. Faiz grew up during a time wherein the subcontinent was engulfed in political strife, having witnessed the Partition of India and the first military take-over of Pakistan in 1958. Thus, he was inclined to break free from the shackles of the *ghazal*-oriented love odes, be it to another man, god, or community, which dealt with the agonies of an unrequited love that individuals faced.¹

Faiz joined the Muslim Anglo-Oriental College in 1933 in a capacity as a lecturer and went on to join the All-India Progressive Writers Association three years later. That formed the bedrock to his later involvement in offshoot movements in Pakistan, wherein he was also a leading writer for the Communist Party which received state-sanctioned backlash. His revolutionary movements were seen largely through the restricted lens of being a Communist, which left his works to the whim of interpreters, filled with ideological prejudice and subjectivity. For what else is the role of a historian in the modern sense but to recreate works and rejuvenate them with life and meaning through an artistic metabolic function (Nora 1996, 13). Many activists and intellectuals are thus unable to see Faiz as anything but a social revolutionary. Presentations of his

1. Unrequited love in relation to God could include works such as Iqbal's *Shikwa* (complaint to God).

works are reduced down to tangential explanations based on his other sayings or sentiments, instead of a lens being applied solely to the text of his poems. By virtue of existing in a postcolonial timeframe, the precolonial elements of his work, such as the recurring Šūfi themes and references to Hallaj are all but lost as everything is interpreted in the context of an Urdu ghazal blemished with new political undertones. The epistemological limitations of such a framework are expansive to say the least. While a logical examination may help in concentrating on how legislative issues and public activity shapes writing as well as the other way around, putting sociological marks on verse is restricting and devastating for abstract examination. However long the *nazm* (poem) stays attached to the writer, it has no abstract independence, no unique kind of energy. In truth, all together for all its likely implications to be understood, the creator needs to vanish.

The multifold meanings of lines within Faiz's poems, such as ham dekheñge which are layered with multiple different metaphors and possible historic references all leading to different interpretations and outlooks in the piece are a classic example of *ma'ni āfirini* (meaning-creation). Such multiplicity of meanings ensures there is no one diaphragm to utilize to express the multivocality of poetic voice in Urdu, which is often coupled with *mazmun āfirini* (theme-creation). The intermixing of Indic sounds and morphology to the Persianized register of Hindustani is a tool exploited to enhance the sound-depth ratios that are vital to Faiz's critical acclaim in the popular spotlight (Faruqi 2006, 45). *Sabk-e-hindi* (the Indianized version of Urdu) has quite a significant amount of *Dhvani* (echo), an aesthetic device derived from Sanskrit, embedded within that serves to emulate a new meaning that may be overriding the otherwise quite apparent literal meaning.² Lines such as *sab but uṭhvāe jaayeñge* (every idol will lie displaced) can imply more than just what comes to eye, despite the very literal historical background to this within Islamic narrations and history (Faruqi 2005, 22). The inconclusiveness, *ibam*, within Indic-formulated Urdu poetry is more often than not credited to Amir Khusrow for his rejection of adapting such themes into Persian and Arabic loanwords in Urdu, and their respective literary theories (Alam 2003, 180). *Kaifiyat* is a state of being wherein a poem is able to yield a lot more than its discernible context, and emotions of tragedy riddled with hope and underlying agony and sadness are found (Faruqi 2003, 855–866).

The poly-interpretability of Faiz's works is an undeniable factor in what makes them so appealing, given the clashes between an assortment of different perspectives that it can be seen to be propagating. Islamic socialism, to the

2. Not to be confused with the Sanskritized and Prakrit-influenced register of Hindustani, Standard Hindi.

distinctly Soviet brand of Marxism, or the anti-colonial struggle of an Indian independence activist or one fighting the settler colonialism in Islamabad and Delhi elites. His poems can not be constricted to one dimensional views by classifying him as a revolutionary within the Eastern world or 'third-world', in the context of Cold War politics in which Faiz was well-versed, as it would reduce interpretive capability to appreciate the breadth of his aesthetic technique. A sociological frame of reference may benefit more from noting the appeal and reception of the masses to his works. It would compel the inquirer to adopt a different set of instruments and frame of reference to analyze Hum Dekhenge, and should then be done in conjunction with frames on Iqbal and Habib Jalib's works (Shahid 2013, 8).

Background

To understand the depth and message of one of Faiz Ahmed Faiz's critically acclaimed works, ham dekheñge, is no easy feat. It was written originally in Urdu in 1979, acquiring its first publication two years after in his seventh poetry book - Mere Dil Mere Musafir - which was dedicated to Yāsir 'Arafāt due to Faiz's sympathies for the cause of Palestinian liberation. Even the title of the poem is a misnomer, a reflection of the adaptation of South Asian society to its own cultural norms in rejection of the earlier pure Arabic subject, Va Yabqá Vajhu Rabbika (And the countenance of your Lord will outlast all). The phrase comes from Surah (chapter of the Quran) Ar-Rahman, Verse 27:

وَيَبْقَىٰ وَجْهُ رَبِّكَ ذُو الْجَلَالِ وَالْإِكْرَامِ

"And there will remain the Face of your Lord, Owner of Majesty and Honor"³

"Only your Lord Himself, full of Majesty and Honor, will remain forever."⁴

Abu al-Fiḍā 'Imād Ad-Din Ismā'īl ibn 'Umar ibn Kathīr al-Qurashī Al-Damishqī, colloquially known as Ibn Kathir, wrote in his famous Tafsir⁵ that the aforementioned verse is parallel to the following verses in a number of regards:

3. Translation provided by Sahih International

4. Translation provided by Dr. Mustafa Khattab in "The Clear Quran"

5. Exegesis of the Quran.

كُلُّ شَيْءٍ هَالِكٌ إِلَّا وَجْهَهُ

“Everything will perish except his face” (28:88)

In this verse Allah describes his face as one worthy of being esteemed, and thus demanding of obedience.

وَاصْبِرْ نَفْسَكَ مَعَ الَّذِينَ يَدْعُونَ رَبَّهُمْ بِالْغَدَاةِ وَالْعَشِيِّ يُرِيدُونَ وَجْهَهُ

“And keep yourself patiently with those who call on their Lord morning and afternoon, seeking His Face.” (18:28)

إِنَّمَا نُطْعِمُكُمْ لُوجْهَ اللَّهِ

“We feed you seeking Allah’s Face only.” (76:9)

Abdullah ibn Abbas has suggested that the meaning of *Dhul-Jalal wal-Ikram*, omitted by Faiz in the titling of the poem, refers to [Allah] being the owner of greatness and pride himself. Yet the contents of the *nazm* (poem) reveal that it is in fact a literal manifestation of the power of God, with false idols being removed to signify the pride and authority of ‘the One’. The first verse (Mişr‘) of the poem, ham dekheñge (we will see) signals to many a call towards the end of times, corroborated by the preceding verse of Surah Rahman stating that all will perish on this earth and that God alone will remain to judge them in the Hereafter. Reference to the ‘Face’ as a divinely attribute to be accepted without question or anthropomorphic reasoning is also implied in chapter two⁶ of the Quran wherein earth-shattering punishment is ordained for transgressors. Other notable references to the Allah’s Face as a manifestation of authority and executive decision-making are also present in the Quran⁷, with analogies of control of the East and the West being reminiscent of Islamic beliefs regarding the rising of the sun from the west on the Day of Resurrection/Judgment.

6. Surah Baqarah, Ayah (verse) 19: “Or [it is] like a rainstorm from the sky within which is darkness, thunder and lightning. They put their fingers in their ears against the thunderclaps in dread of death. But Allah is encompassing of the disbelievers.” - Sahih International

7. Quran, translation provided by Saheeh International - 2:115: “And to Allah belongs the east and the west. So wherever you [might] turn, there is the Face of Allah. Indeed, Allah is all-Encompassing and Knowing.”; 2:272: “Not upon you, [O Muḥammad], is [responsibility for] their guidance, but Allah guides whom He wills. And whatever good you [believers] spend is for yourselves, and you do not spend except seeking the face [i.e., approval] of Allah. And whatever you spend of good - it will be fully repaid to you, and you will not be wronged.”; 13:22: “And those who are patient, seeking the face [i.e., acceptance] of their Lord, and establish prayer and spend from what We have provided for them secretly and publicly and prevent evil with good - those will have the good consequence of [this] home”;

Interpretative methods

Prior to embarking upon the journey of unraveling Faiz Ahmed Faiz's critically acclaimed poem, one must take into consideration the differing ways in which it can be interpreted. Literature as a whole is subject to the whims of people, be it fellow writers and poets, or readership and critics. The same is true for the genre of poetry within the liberal arts, and this is only magnified by the political, social, and religious intersection of a piece such as *ham dekheñge*.

There are some who contend that the underlying intentions of the author is the only correct mode of interpretation and analysis. On the flipside, others hold that intention is of no consequence and that the fluidity of words renders any grasping onto the thoughts of the original writer a futile effort. This forms the basis of a heated debate, one exacerbated by the various critics of major pieces who find themselves in a position to justify one argumentative approach over another to serve the interests of their era (Swirski 2010, 133). Some go so far as to suggest that it is in fact the character of the speaker, in this case Faiz Ahmed Faiz, that allows for persuasion to the audiences to formulate concurring views on the subject matter. In a famous oratory lecture, John Lawson sums such a position by claiming that one "cannot be much affected by what he (the speaker) says if you do not look upon him to be a Man of Probity, who is in earnest, and doth himself believe what he endeavoreth to make out as credible to you" (Lawson 1760, 172). Naturally this poses the question of if the speaker is thus monolith, as Iqbal Bano is the first to publicly sing this poem in front of a large crowd. Should her background be looked at then, and in what context given the ranging views of conservative Islamists and social democrats of the Pakistani People's Party on her performances? Would Coke Studio's 2018 version, which omitted some lines from the text, now be the authoritative body whose background readers should seek to understand to accept the validity of the poem's underlying message?

Charles Fillmore paved the way for another outlook on understanding readership, worth quoting as length as follows:

"A text induces the interpreter to construct an image or maybe a set of alternative images. The image the interpreter creates early in the text guides his interpretation of successive portions of the text and these in turn induce him to enrich or modify that image. While the image construction and image revision is going on, the interpreter is also trying to figure out what the creator of the text is doing--what the nature of the communication situation is. And that, too, may have an influence on the image creating process (Fillmore 1974, 4)."

The idea that people are ultimately influenced in any discourse by the context in which utterances are made stems back to a very generic argument circulated

as a quasi-middle ground approach attempting to shelve away from the debate between proponents and opponents of intentionality (Erickson & Schultz 1977, 6). An investigation conducted by the University of Urbana-Champaign a significant impact from author-reader relationship, be it from from personal acquaintance to shared goals to background on the subject, on the evolution of the thought process of readership in grasping a piece (Tierney et al. 1983, 7). Others have also pushed the prevailing view that readers ought to be respected and elevated in stature for their insurmountable contributions at understanding how an author's works are a patchwork of so many different cultural nuances and source-materials, including those not intended to be the case by the author themselves due to how it may have simply been transmitted into their style in the most natural of ways (Roland 1977, 146).

That is not to say of course that all interpretations are valid, as they must be conducted within the realm of reason. Ham dekheñge's use of Islamic imagery is notable since it was used in opposition to a regime that identified with a Pan-Islamic identity, and people speaking to its literal allusion to the end of times is more acceptable than the fatuous suggestion that the piece promotes an anti-Hindu sentiment based on a line referencing the nullification of false idols. The multiplicity of options in regards to meanings, noting that reading context can significantly alter and color interpretations, does not necessarily imply that all such viewpoints are contextually legitimate. Needless to say, explication has its limits and the coherence of a text coupled with a reader's background, an inherent bias, will influence decision-making in attempting to elucidate the meaning of a text (Eco 1997, 41, 59).

The circumstances surrounding a poem's birth are often forgotten in future generations unless there is some explicit textual mention of it, something not found in ham dekheñge. Hence, the versatility of the poem allowed it to be sung by a march of student protestors rallied in opposition to the Indian Citizenship Amendment Act in 2019. Definitive references to a specific space or time are scarcely ever present in Faiz's works, with ham dekheñge being no exception to this underlying theme. His poems have largely been recited and sung more than they have been close-read, hence the need to obscure the underlying cause and effect that brought about the piece to begin with.

Analysis and Islamic imagery

When looking at a poem such as ham dekheñge which is written originally in the Urdu language, one must recognize the backdrop of the literary society that *nazms* (poems) originated in. Urdu's original name was *Zaban-e-Urdu* (language of the [exalted] camp) given 'ordu' meaning camp in Turkic languages such as Chaghtai. It was a symbol of the literary and societal elites, as it was championed

under the Mughal Empire. Thus, this Persianized register of the Hindustani language became the preferred tongue for Muslims in the Indian subcontinent, with the less Prakrit or Sanskrit drawn vocabulary, in favor of Persian and Arabic, noting higher degrees of prestige.

Faiz's poetry must be read through the context of his own political leanings, a Marxist by his own admission, which landed him in the government of Zulfiqar Ali Bhutto and found himself in exile in Moscow. Ham dekheñge (we shall see) is an allusion to seeing a change in time, intended to be against Zia ul-Haq who is considered the arch-nemesis of this polemic. At first glance, many can also think that it is speaking out of a disheartened state of mind with the world around us and thus looking forward to the Day of Judgement, prophesied in Abrahamic faiths, as an end of time-event where justice will be delivered in the courts of Allah. As with much of this poem, there is a play on a Quranic phrase here, "Fa satubširu wa yubširun (So, you will see, and they will see).⁸ The very word *maftun* in the succeeding verse refers to one being demented, and is in the context of an assurance by Allah that the accusations derailed against the Prophet Muhammad will be disproven for their position at a later time when justice will prevail.⁹ It turns the tables on the accusers, by fermenting a prophecy in an unequivocally challenging tone, akin to that of Faiz's, that the test of

8. Surah Al-Qalam Aya 5 - Translation provided by Maarif-ul-Quran

9. Worth quoting at length here are Urdu Tafsirs for verse 5 and 6 (to be read together) provided in *Fi Zilalul Quran* and *Bayan ul-Quran*:

فستبصر... بالمہند (7) (86: 5 تا 7) "عقرب تم بھی دیکھ لوگے اور وہ بھی دیکھ لے گیے کہ تم میں سے کون گمراہی میں مبتلا ہے۔ تمہارا رب ان لوگوں کو بھی خوب جانتا ہے جو اس کی راہ سے بھٹکے ہوئے ہیں، اور وہی ان کو بھی اچھی طرح جانتا ہے جو راہ راست پر ہیں۔"المفتون (86: 6) سے مراد ہے گمراہ اللہ فرماتا ہے کہ اللہ ہدایت یافتہ لوگوں کو بھی جانتا ہے اور گمراہوں کو بھی۔ یا اس کے معنی ہیں وہ شخص جو آزمائش میں ڈال دیا گیا ہے اور جس کا نتیجہ نکلنے والا ہے۔ دونوں مفہوم قریب قریب ہیں۔ اس وعدے میں رسول اللہ اور مومنین کے لئے اطمینان ہے جبکہ مخالفین کے لئے دھمکی ہے۔ انہوں نے رسول اللہ ﷺ پر جنون کا الزام لگایا تھا۔ اس جنون سے ان کی مراد یہ ہے کہ آپ کی عقل چلی گئی ہے کیونکہ واقعی صورت حال اس کی تکذیب کر رہی تھی بلکہ اس سے مراد لیتے تھے کہ آپ پر جنون کا اثر ہو گیا ہے اور اس میں ان کا اشارہ اس طرف تھا کہ ہر شاعر کے ساتھ ایک شیطان ہوتا ہے، جو اس پر شعر وحی کرتا ہے۔ اشارتاً وہ نبی ﷺ کی طرف اس بات کو منسوب کرتے تھے جبکہ نبی ﷺ جو تعلیمات پیش کرتے، ان کا تعلق نہ شعر سے تھا اور جنون کی باتوں سے۔ اس آیت میں اللہ تعالیٰ تسلی دیتا ہے کہ مستقبل نبی ﷺ کی حقیقت کو بھی ظاہر کر دے گا اور آپ کی تکذیب کرنے والوں کی حقیقت کو بھی۔ اور معلوم ہو جائے گا کہ دونوں میں سے کون گمراہ ہے؟ اور مزید اطمینان کے لئے کہا جاتا ہے کہ رب تعالیٰ تو جانتا ہے کہ کون گمراہ ہے اور کون راہ راست پر ہے۔ یہ کلام تو وہی وحی کر رہا ہے۔ لہذا اس سے کوئی بات پوشیدہ نہیں ہے۔ یہ ایسی بات ہے جس کی وجہ سے آپ دشمنوں کی ہر زیادتی کو برداشت کر لیتے تھے اور اس کے نتیجے میں آپ کے دشمن پریشان ہو جاتے تھے اور آپ کی ثابت قدمی کی وجہ سے ان کے اندر قلق اور تزلزل پیدا ہو جاتا تھا، جیسا کہ اگلی آیات میں آتا ہے۔ اگلی آیت میں آپ کو بتایا جاتا ہے کہ اندر سے ان لوگوں کا حال بہت پتلا ہے۔ ان کی سوچ اندر سے کھوکھلی ہو چکی ہے۔ بظاہر تو وہ مخلصت کرتے ہیں، جھگڑتے ہیں، حق کا انکار کرتے ہیں، آپ ہر طرح کے الزامات لگاتے ہیں، لیکن اندر سے ان کے اندر تزلزل پیدا ہو گیا ہے۔ وہ بل گئے ہیں اور جن عقائد پر وہ جمے ہوئے نظر آتے ہیں، درحقیقت ان کے ایک بڑے حصے پر خود ان کو اعتماد نہیں ہے۔ یہ سودا بازی کے لئے تیار ہیں، یہ چاہتے ہیں کہ کچھ آپ نرم ہوں اور کچھ یہ نرم ہوں لیکن جن لوگوں نے نظریاتی انقلاب لانا ہوتا ہے وہ تب ہی لاسکتے ہیں جب وہ اپنے اخلاقی نظریات پر جم جائیں۔ ان لوگوں کے جو عقائد ہیں یہ ان کے بارے میں کچھ زیادہ سنجیدہ نہیں ہیں۔ انہوں نے چند ظاہری رسول کو پکڑا ہوا ہے جن کے ساتھ ان کے مفادات وابستہ ہیں۔ لہذا ان کی کوئی بات نہ مانو۔ آیت 5 {فَسْتَبْصِرُ وَ يُبْصِرُونَ} "تو عقرب آپ ﷺ بھی دیکھ لیں گے اور وہ بھی دیکھ لیں گے۔" یہ بڑا پیارا اور صاحبانہ انداز

time will prove who was insane and in error. It is worth mentioning that in *Maarif-ul-Quran*, those who did not read the signs of time are construed as having additionally failed to recognize the “light of Truth”. This is reminiscent of another phrase *An-al-Haq* (I am Truth) in this poem. In the succeeding line, *lāzim hai ke ham bhī dekheñge* (Inevitably, we shall also see the day) there is this concentrated reaffirmation of how certain it is that they will see this day. No room for negotiation or bending of will is present in this expressed sentiment.

Interestingly enough, Faiz largely rejects the confines of Arabic metre and prosody such as *ramal*, which was championed by the other ‘Poet of the East’, Muhammad Iqbal, in *shikwa* and *javāb-e-shikvā*. Yet nevertheless, Qafiya and Radif (Persian for order) are still embedded within it, with *vaada hai* and *likha hai* repeating the āsound for Qafiya and *hai* for Radif across the hemistich in the second *sh‘r* (prosodic unit). Following that, another word, *v‘dā* (promise) is used in lieu of *lāzim* (inevitably) to signify that this is a promise from Allah, one that was promised to them as a people. The people, known to be referring to a pluralistic group due to *ham* signifying we, are akin to those mentioned in Surah Taha Verse 86: “Faraja’s Moosaaa ilaa qawmihee ghadbaana asifaa; qaala yaa qawmi alam ya’idkum Rabbukum wa’dan hasanaa; afataala ‘alaikumul ‘ahdu am arattum ai yahilla ‘alaikum ghadabum mir Rabbikum fa akhlaftum maw’idee (Then Mūsā - Moses - returned to his people in a state of anger and sorrow. He said: “O my people! Did not your Lord promise you a fair promise? Did then the promise seem to you long in coming? Or did you desire that wrath should descend from your Lord on you, that you broke your promise to me (i.e. disbelieving in Allāh and worshiping the calf)”.¹⁰ *Din* is used for day instead of the Arabic-origin *Yaum*, which hints that Faiz’s intention is not to speak of the Day of Judgment in the literal sense as written in the Quran. There is instead an underlying theme of an eternal truth, something that irrevocably will happen. For example, after a period of warmth comes cool, be it seasonal or after years of climate change, and that after day comes night, no matter the length or duration of either. In this case, Faiz claims that after oppression comes ease, a regurgitation of Surah Ash-Sharh verse 4: “Fa inna ma’al usri yusra” (Verily, along with every hardship is relief).¹¹ The ease is considered to be one coming in abundance, with the verse being repeated right after in a similar form in that chapter.¹² This mythological dilemma was thus presented to the masses as a

ہے۔ جیسے کوئی بڑا کسی چھوٹے کو سمجھاتا ہے کہ آپ مخالفانہ باتوں پر آزرده نہ ہوں کچھ ہی دنوں کی بات ہے
’اصل حقیقت بہت جلد کھل کر سامنے آجائے گی۔ پھر کسی کو کوئی شک و شبہ نہیں رہے گا

10. Translation provided by Abridged Explanation of the Quran.

11. Translation provided by Muhammad Taqi-ud-Din al-Hilali & Muhammad Muhsin Khan.

12. Worth quoting at length here is *Maarif-ul-Quran* and *Fi-Zilalul Quran’s* Urdu Tafsir for verse 5 and 6: “Grammatically, if the Arabic definite article al- is prefixed to an Arabic noun and is repeated with the same definite article al-, they refer to the same antecedent. However, if the same

reassurance that the forces of civil liberties will prevail after the inevitable collapse of the authoritarian government.

Lau-e-azl literally means the tablet of eternity, used within Quranic discourse, this refers to an eternal slate on which the destiny of the world and all its inhabitants has been written and determined. Naturally, its implications regarding predestination has puzzled many Muslim theologians. Yet this verse has not only intrigued elites/academics/thinkers/theologians, etc. but also the common masses. It comes in the last Juz of the Quran, in a chapter oft known and memorized by the masses and those who are not as well acquainted with the rest of the Islamic text.¹³ Its accessibility is imperative to formulating its narrative to

noun is repeated without the definite article, they refer to different antecedents. The word al-'usr '[the] hardship' in verse is the repetition of al-'usr '[the] hardship' occurring in verse. It does not refer to a new hardship. In contrast to this, the word yusr 'ease' in both verses occurs without the definite article. This indicates that the second yusr 'ease' in verse is a different antecedent to the yusr 'ease' occurring in verse. Thus it may be concluded that there is only one 'usr 'hardship' and two yusr 'twofold ease'. 'Twofold ease' does not mean twice as much. In fact, it means 'manifold ease'. The verse signifies that only one kind of hardship will face him, but in the wake of it many kinds of ease are assured. Sayyidna Hasan Al-Basri (رح) reports that once the Holy Prophet ﷺ emerged from his home in a very happy mood and, giving cheerful news to his Companions on the basis of the current verse, said: "One hardship cannot overcome twofold ease". Thus history and biographical books written by Muslims and non-Muslims - all bear ample testimony to the fact that the most difficult task, even the seemingly impossible task, became easy for him. The above narration further indicates that the Arabic definite article al- signifies that it is an article used to indicate previous knowledge [that is, al- lil 'ahd] and refers to the hardship of the Holy Prophet ﷺ and his Companions. Allah kept to His promise to them in such a way that the world saw it visibly how in the wake of every hardship the Holy Prophet and his Companions experienced the manifold ease that made their task easy. If a person does not achieve 'ease' after 'hardship', it does not contradict this verse. In fact, even now Allah's universal principle applies. One needs to exercise fortitude against hardship, rely on Allah with purity of heart, devote oneself totally to Him, hold onto high hopes for His grace, and one should not despair of His mercy if there is delay in success - He certainly will grant relief after every instance of hardship. [Fawa'id-e-' Usmaniah]. Hadith narratives support this."

پس حقیقت یہ ہے کہ تنگی کے ساتھ فراخی بھی ہے۔ بیشک تنگی کے ساتھ فراخی بھی ہے۔ "حقیقت یہ ہے کہ مشکل کے ساتھ آسانی لازمی ہے اور مشکل کے بعد آسانیاں ہوتی ہیں۔ اور اے نبی یہ آپ کے ساتھ بھی لازم رہی ہے۔ جب آپ پر دعوت کا بوجھ بھاری ہو گیا تو ہم نے آپ کا دل کھول دیا، یوں آپ کا بوجھ ہلکا ہو گیا جس نے آپ کی کمر توڑ دی تھی لہذا مشکل کے ساتھ ہی آسانی جڑی رہی اور یہ بھاری بوجھ ہلکا ہو گیا۔ یہ اصول ایک اٹل اصول ہے، اس لئے اسے انہی الفاظ میں مکرر لایا گیا ہے۔ فافان مع۔ یسرا (6:94) " پس حقیقت یہ ہے کہ تنگی کے ساتھ فراخی بھی ہے۔ بیشک تنگی کے ساتھ فراخی بھی ہے۔ " یہ تکرار اس بات کا اظہار کر رہا ہے کہ جس وقت یہ آیت نازل ہو رہی نہیں حضور اکرم ﷺ بے حد مشقت اور تنگی میں تھے۔ اس لئے اللہ نے اس مسئلہ کی طرف اس طرح توجہ فرمائی، یاد دہانی فرمائی، اللہ نے حضور کی ذات کے حوالے سے اپنی سابقہ مہربانیاں گنوائیں اور اپنے فضل و کرم اور دستگیری کا ذکر کیا اور آئندہ کے لئے بھی اسی اصول کو تاکید مزید کے ساتھ بیان کیا، تاکہ آپ کو تسلی ہو کہ بہتر دور آنے والا ہے۔ یہ بات معلوم ہوتی ہے کہ حضور اکرم جن مشکلات میں گھرے ہوئے تھے وہ کوئی سخت مشکلات تھیں۔ اب بتایا جاتا ہے کہ آپ پر جو بہتر دور آنے والا ہے وہ کس طرح آئے گا اور انشراح صدر کے حقیقی اسباب کیا ہوا کرتے ہیں اور دعوت اسلامی کی طویل راہ میں اور دشوار گزار سفر میں زاندرہ کیا ہے، سیراب ہونے کے ذرائع کیا ہیں۔

13. The 114 Surahs will be considered chapters for the sake of this paper, and the 30 Juz will be noted as they are with no English modification.

begin with. The metaphor is used to also refer to the Quran itself in the last verse of Surah Al-Buruj, with *lauh-e-mahfooz* referring to the Quran's eternal nature, coinciding with the Ashari/Maturidi theological position on the subject.¹⁴ The destiny of revolution is thus protected by divine ordinance, something the oppressor cannot grapple with.

In the next six lines, the imagery in regards to the end of times is akin to Quranic tropes on doomsday narratives preceding the final day of judgement. For example in Surah Al-Qari'ah verse 4-5, "Yauma ya koonun naasu kal farashil mabthooth. Wa ta koonul jibalu kal 'ihnii manfoosh" (It is a Day whereon mankind will be like moths scattered about, and the mountains will be like carded wool).¹⁵ Carded wool, presumably fluffed up, has the same meaning as *rūi* (cotton fluff). The line in the poem *jab zulm-o-sitam ke koh-e-garaa'n* (when dark peaks of torment and tyranny) is claiming that when a valley is filled up with so much oppression that the people cannot withstand it any further, then the promise from Allah will be fulfilled and it will flow away.

14. It is reported by Ibn Manzoor that Al-Lawh refers to every wide, flat surface or sheed. Al-Azhari claims that al-Lawh is in fact a flat source of wood, which when written on can be called a lawh in its truest form. He adds that it also refers to the shoulder blade of an animal. Lissan al-Arab (2/584) contains mention of the plural form of lawh being alwaah, and that it means every wide bone. Ibn Katheer said al-Lawh al-Mahfooz (the Preserved Tablet) means it is among the higher group (i.e., angels), preserved and protected from anything being added or taken away, or any alteration or changes (Tafseer Ibn Katheer, 4/497, 498). Ibn al-Qayyim said that implies preservation, given that most readers recite this with a kasrah, implying a description of the Lawh itself. It suggests that satan and devils could not hope to bring it down due to its location and reach being far beyond their confines, and that its own protection ensures that no one could take or add anything to it. Surah Hijr verse 9 further affirms Allah's promise as having sent down the Quran as a source of guidance and the promise to protect it. It can thus be understood that Allah is not only protecting its location, safeguarding it from omission, deletion, or distortion, but is also protecting its meaning from being twisted or changed alongside its letters. (al-Tabyaan fi Aqsaam al-Quraan, p. 62). Other reports found in Tafseer books suggesting that al-Lawh al-mahfooz is found specifically on the angel Israafeel's forehead or that it was born out of green chrysolite have not been proven conclusively. In Islamic eschatology, it is viewed as something that is part of the knowledge of the Unseen (ilm ul-ghayb).

In *Bayan-ul-Quran* the following is said of the verse:

یعنی اصل قرآن مجید اللہ تعالیٰ کے پاس لوح محفوظ میں ہے۔ جس مقام کا ذکر یہاں لوح محفوظ کے نام سے ہوا ہے
سورۃ الزخرف کی آیت 4 میں اسے اُمُّ الْکِتَابِ 'سورۃ الواقعہ کی آیت 78 میں کِتَابٌ مَّکْنُونٌ اور سورۃ عبس کی آیات 13
اور 14 میں اسے صُحُفٍ مُّکْرَمَةٍ مَّرْفُوعَةٍ مُّطَهَّرَةٍ کہا گیا ہے

15. Translation provided by Muhammad Taqi-ud-Din al-Hilali & Muhammad Muhsin Khan. *Fi-Zilalul Quran* contains the following explanation:

یہ تو تھا اس کھٹکھٹانے والی اور عظیم حادثے کا پہلا منظر۔ اس کو دیکھتے ہی دل ٹکڑے ٹکڑے ہو کر اڑنے لگتا ہے۔
انسان پر کپکپی طاری ہو جاتی ہے اور وہ یوں محسوس کرنے لگتا ہے کہ اس دنیا کی ہر وہ چیز جس کا سہارا وہ لے
سکتا تھا، اڑی اڑی سی جا رہی ہے۔ وہ ہوا میں اس طرح اڑتی ہے جس طرح ذرے اڑ رہے ہوتے ہیں اور اچانک آخری
اور مکمل خاتمہ سامنے آجاتا ہے۔

The next four lines dealing with crashing lightning and the beating heart of earth need to be read together. *Mahkūmoñ* comes from the Arabic and Urdu base *hākīm* which roughly translates to a ruler. When a ruler gives a command, the recipient becomes a *mahkūm*. The use of the plural *we*, *ham*, before it means that when people stand united, only then will they rise above the *paañ* (feet). Yet the masses' feet are considered broken, due to not having stood against tyranny together and they are also meant to dually shatter the feet on which the *hākīm* stands. This is a call for a complete revolution, akin to the Marxist leanings of Faiz, as a call against exploitative capitalism, authoritarianism, and imperialism. In India and other Muslim-majority countries, *hakim* and *hakīm* refer to physicians or a wise man. The use of this word instead of *rāj* for kingship or another Prakrit-drawn equivalent to describe the domain of a ruler is particularly interesting given Faiz strays away from that in the end of his poem. Over there it uses the word *rāj* to describe the moment of victory when the people will take control, a stylistic choice rejecting the Islamist regime of Zia ul-Haq in favor of the terminology derived from its professed archnemesis, "Hindu India". *dhar dhar dharkegī* is speaking of the heart of the earth, a call deep within mother nature begging for change. This too resembles Islamic themes of earth shattering punishment as well as the physical changes to come to the earth that will bring about its collapse, with descriptions of lava and the things within the core being akin to the punishment of eternal hellfire. The alliteration in that line and *kar kar karkegī* is not lost, given it emphasizes the actions that will take place as a rallying cry for the people to awaken from their long slumber. Without explicitly using the word for heart in Urdu, it is implied that humans will be able to possess a true heart, individually and collectively when revolution breaks out as their combined weight will cause the ground to shake and the oppressor's feet to collapse. *Asmaisout* (onomatopoeia) is also present extensively in this in terms of the sounds of a beating heart and a lightning storm being present reflecting what actually occurs during those phenomenons. There is of course *Radeef* rhyme present at the end of the two lines with the *kegī* phrase repeating itself. Thereafter, the phrase *ahl-e-hukam* is used to refer to the tormentors who persecute revolutionaries and those failing or refusing to conform to the political standard of the time. Once again the word that resembles the *hakim* physician-like attributes is used, despite the connotation being completely different. Instead, *ahl* implies a gathering of people, a household or group of sorts, and thus Faiz suggests there is a large and embattled conspiracy against the people that gather together to plot.¹⁶ The revolutionaries are also being foretold to expect the light-

16. The word *ahl* (أهل) refers usually to the person of one's household including clansmen and extended relatives identifying as part of this group, be it on social, religious, national, or in this case political grounds.

ning to go *sar ūpar* (above the head) as in that their power will so far exceed that of the current oppressors that they will tremble with fear, a stark contrast from being underneath the feet of them prior.

In *jab arz-e-khudā ke k'be se* (When, from the seat of the Almighty) a great many literary features are present, including alliteration with the 'k' sound at the beginning of several words. *jab* once again refers to destiny and a time to come that is being awaited for by the people and narrated to for its signs. *arz* usually refers to someone speaking at length, but also from an Arabic root literally translates to earth. *k'hudā* is the generic name for god in Urdu, with Allah being specific towards the Lord's name per Islamic beliefs. In the context, the phrase *arz-e-khudā* seems to be taking the outlook by naming the people who call themselves god, or act in such an authority or manner that defies the thought of challenge. The confidence and conviction that the oppressors have that they are in fact Almighty, can do as they please with no accountability or reckoning is being mocked here. *k'be* refers to the *k'ba*, Islam's holiest site in Mecca which serves as the center of worship and a house of Allah. *k'ba* literally means a cube in Classical Arabic, but per references from the Quran it is clearly evident that it can also signify a temple of sorts or seat of authority.¹⁷ *But*, pronounced not with a hard 't' in Urdu but with emphasis on the latter letter, translates to idols. It is a clear play on the story of the Conquest of Mecca as narrated in *Ṣaḥīḥ al-Bukhārī*, wherein the Prophet Muhammad and the Muslim armies entered largely without bloodshed into the now epicenter of global Islam and struck down some 360 idols and promised that never again will falsehood find its way from there or emerge from within.¹⁸ In the next two lines, there is also *kk'baḥiyā* with the 'se' and 'ge' sound at the end of the individual *misrs*, as well as rhyming patterns in 'jab' and 'sab'. Thus there are clearly two profound meanings here, one being that from the land of God (when applying the earth definition of 'arz'), which encompasses the entirety of the world, false ideologies will be removed. Pakistan claims itself to be such on the basis of being a homeland for Indian Muslims. In such a claim, a parallel is being drawn between the Quraysh of Mecca, known for their atrocities in pre-Islamic Arabia to the authoritarianism of Zia ul-Haq's regime. Despite the allusion to a dystopian end of time scenario, the other plausible and intended meaning is that those who are self-proclaimed gods, i.e dictatorial rulers or imposers of their own will, will be removed.

17. Quranic examples of references to the Ka'bah: *al-Bayt* (Arabic: *بَيْتِ بَلَاءٍ* lit. 'the house') in 2:125, *Baytī* (Arabic: *بَيْتِي* lit. 'My House') in 22:26, *Baytik al-Muharram* (Arabic: *بَيْتِكَ الْبَيْتِ الْحَرَامِ* lit. 'Your Inviolable House') in 14:37 as spoken in Prophet Ibrahim (Abraham)'s voice, *al-Bayt al-Harām* (Arabic: *بَيْتِ الْحَرَامِ* lit. 'The Sacred House') in 5:97, *al-Bayt al-'Atīq* (Arabic: *بَيْتِ الْبَلَاءِ الْبَقِيَّةِ* lit. 'The Ancient House') in 22:29.

18. Bukhārī 2000, 59: 583

The next two lines represent a shifting tone, from the continuous references to a future with 'jab' to something that is coming sooner, more tangible and in the soon to be present. *Ahl-e-safā* means the pure people, those with rightly guided intentions on the straight path per Surah Fatiha's supplication of being on the path of those not led astray. Aṣ-Ṣafā also refers to the mountain in Mecca, adjacent to Marwah, where Muslims routinely walk between in pilgrimage in emulation of Hajar's, the second wife of Ibrahim, drought-filled journey before discovering zamzam water. To be considered the people of Aṣ-Ṣafā denotes a high degree of honor, as it is a semblance of purity of intentions and Allah's promise and favor amongst the aforementioned group. It is important to note that *jabl* or *pahaar* was not used when referring to *safā* but rather *ahl*, akin to the Pakistani motto of purity and advancing the notion that the land is in fact *pāk* (pure).¹⁹ *Haram* means something that is forbidden in traditional Islamic jurisprudence, yet also encapsulates simply a sanctuary such as Mecca which is a *haram* due to the stringent laws pertaining to the actions, crimes, and prosecutive measures within its confines. It has even been noted to be a sanctuary for alleged criminals seeking recourse, and to the contemporary era poses a challenge for state officials such as Saudi Arabia in tackling the 1979 Grand Mosque Seizure. This is particularly as a result of the ban on firearms in the *haram* and weapons of any sort, save those ordained for ritual sacrificial slaughter. The poem can be seen to be condemning the use of lethal force by Zia's regime against civilians and protestors. In Classical Farsi, *Marūdd* means a castaway, reprobate, an anathematized individual, or an offcast. Thus *mardūd-e-haram* implies someone who has been rejected from the higher echelons of society which is guarded and gets away with their crimes against humanity. *Masnad* is a seat or position, different from a throne, but one that is lavish and couch-like and filled with pillows and riches. It resembles that which princes, shehzadas, and nawabs sit upon while feasting on food in their *harems*, another layer adding to the depth of Faiz's word choice and stylistic choices. It is also foretold as a sign of grace by Allah on the followers of the Prophet Muhammad and their eventual success, as in the following verses. In Surah Al-Kahf verse 31, "Uleaika lahum canneatu aadnin tacree min taahtihimul anhaaru yuhaallavna feehea min aseavira min zahabin va yalbasoona siyeaban hudran min sundusin va istabrakin muttakiiena feehea aalal areaik, ni'mas saveab, va haasunat murtafakea" (These! For them will be 'Adn (Eden) Paradise (everlasting Gardens); wherein rivers flow underneath

19. Pakistan in Persian consists of two words put together, "Pak" meaning pure and 'stan' referring to land, with an i being added to ease pronunciation. It literally translates to land of the pure. It also is an acronym as stated by Choudhry Rehmat Ali in his 1933 pamphlet *Now or Never; Are We to Live or Perish Forever?* with P standing for Punjab, A for Afghanistan (another name for the North-West Frontier Province, now known as Khyber Pakhtunkhwa), K for Kashmir, S for Sindh, and tan for Baluchistan.

them; therein they will be adorned with bracelets of gold, and they will wear green garments of fine and thick silk. They will recline therein on raised thrones. How good is the reward, and what an excellent Murtafaq - dwelling, resting place).²⁰ Again in Surah Ya-Sin verse 56, "Hum va azveacuhum fee zilealin aalal

20. Translation provided by Muhammad Taqi-ud-Din al-Hilali & Muhammad Muhsin Khan. *Maarif-ul-Quran* dives into talk on issues pertaining to Islamic ethics and society in regards to gender norms and the shattering of such in different spaces and times, *opinions and interpretations therein do not necessarily reflect the view of the author of this paper*: "At this point, someone may doubt that this advice was reasonably practicable. A separate gathering for them would have not hurt. In fact, it would have made it easier to convey the message of Islam to them and equally easier for them to accept it. But, the creation of such a division would have amounted to seating the rebellious rich on a pedestal of honor, an action that could have broken the hearts of poor Muslims or dampened their courage. Allah Ta'ala, in His ultimate wisdom, would not put up with anything like this. Instead, the ground rule of Da'wah and Tabligh given by Him was that there should be no discrimination or distinction against or for anyone in it. Allah knows best. Ornaments for the People of Jannah - It has been mentioned in verse 31: *أهيف نؤلحِي* (They will be adorned therein) that men inmates of Jannah will also be adorned with bracelets of gold. The question it may bring up is that wearing ornaments is neither becoming for men, nor can these be called beauty and embellishment in any relative sense. If bracelets were put on them in Jannah, maybe they would make them look awful. The answer is that embellishment and beauty are subservient to practice or custom as recognized in a society. What is considered to be embellishment and beauty in one country or region could more than often be detested in other countries and regions. And this could be the other way round as well. Similarly, something is taken to be an embellishment in a given period of time. Comes another time and it becomes a blemish. When ornaments and silk dresses will come to be established as embellishment and beauty for men of Jannah too, no one is going to feel strange with it there. That which puts restraints on us here is a law of this world which stipulates that it is not permissible for men to wear any ornament of gold, even a ring or chain for a watch made of gold. Similarly, silk clothes are not permissible for men. This will not be the law of Jannah. That is a universe of existence separate from this entire universe of our experience. It cannot be imagined on the analogy of anything in and around us on this basis alone." *Fi Zilalul Quran* presents the following account:

یعنی یہ بدترین تواضع ہوگی جو گرمی سے جلے ہوئے ان پیاسے لوگوں کی کی جائے گی۔ کیا بری آگ ہوگی اور پھر اس آگ کے وہ خیمے کس قدر بڑے ہوں گے، جو ان کے ٹھہرنے اور آرام کے لئے ان کو مہیا کئے جائیں گے۔ ان کو رہنے کے لئے جو سہولیات دی جا رہی ہیں ان میں بھی ان کے ساتھ ایک نہایت ہی سخت مذاق ہوگا، کیونکہ وہاں ان کو سہولیات تو نہیں فراہم کی جا رہی ہیں۔ یہاں تو ان کو بھول ڈالنے کا انتظام ہوگا۔ البتہ یہاں آگ کے خیموں کا ذکر اس لئے ہے کہ ان لوگوں کی سہولیات کے ساتھ ان لوگوں کی سہولیات کا مقابلہ ہو جائے، جو ایمان لائے اور جنہوں نے عمل صالح کیا، لیکن دونوں کی سہولیات میں زمین و آسمان کا فرق ہوگا۔ یہ تو رہے حالات ان لوگوں کے جنہوں نے کفر اختیار کیا۔ اب رہے وہ لوگ جنہوں نے دعوت حق کو قبول کیا اور نیک عمل کئے تو ان کے لئے سدا بہار باغات ہوں گے اور یہ ان باغات میں رہیں گے۔ ان کے نیچے سے نہریں بہ رہی ہوں گی۔ اونچی مسندوں پر تکیے لگا کر بیٹھے ہوں گے۔ اور ریشم کے قسم قسم کے کپڑوں میں ملبوس ہوں گے۔ نرم ریشم کے اور اطلس کے نرم اور موٹے کپڑوں میں اور زیب و زینت کے لئے انہیں سونے کے کنگن پہنائے جائیں گے۔ نعم الثواب و حسننت مرتفقاً " بہترین اجر اور اعلیٰ درجے کا جائے قیام! " اب جس کی مرضی ہو وہ اس راہ کو اختیار کرے، جو چاہے ایمان لائے اور جو چاہے کفر اختیار کرے، جو چاہے فقراء ایمان کی مجلس میں بیٹھے جبکہ انکے جیوں اور لباس سے پسینہ کی بو آرہی ہے اور جو چاہے ان سے نفرت کرے، جن لوگوں کو ان غریب حضرات کے لباس سے پسینے کی بو پسند نہیں، جن کے دل پاک ہیں اور ذکر الہی سے معطر ہیں تو پھر ان کو چاہئے کہ وہ جہنم کی آگ سے بنائے ہوئے محلات اور خیموں کی سہولیات حاصل کر لیں اور پھر تیار ہو جائیں، تیل کی تلچھٹ یا پیٹ کا شربت پینے کے لئے، جس سے اہل جہنم کے منہ بہر جائیں گے۔ اس کے بعد باقی رہنے والی اسلامی اقتدار اور فنا ہونے والی کافرانہ اقتدار کو سمجھانے کے لئے دو آدمیوں اور دو باغیوں کا قصہ سنایا جاتا ہے۔ دو کردار پیش کئے جاتے ہیں۔ ایک کردار ان لوگوں کا ہے جو زوال پذیر اقتدار کے حامل کا نمونہ ہے اور دوسرا کردار ان لوگوں کا ہے جو لازوال اقتدار کے حاملین ہیں۔ یہ

areaiki muttakioon” (They and their wives will be in pleasant shade, reclining on thrones).²¹ Reference to plush couches are also made one more time, perhaps one of the most notable one in terms of the context being akin to that presented by Faiz, in Surah Al-Waqi’ah verse 34: “Va furushin marfooah” (And on couches or thrones, raised high).²² The line is calling upon a time that the people will finally sit on these seats, not in the sense of a transfer of power, but that democracy and the people’s voices will prevail to be in the noble sanctuary. *biḥāye* and *jāyeñge* both have similar rhyming sounds within in terms of the ‘āy’ getting repeated in pronunciation.

The promise of an eternal democracy and the removal of any last remnants of kingship, frequently akin to absolutism as was practiced by the authoritarian meaning of Zia ul Haq’s government, is then cast to be permanently over. All crowns and thrones are being foretold to fall off the mighty heads of the oppressors, with *sab* and *jāyeñge* repeating itself in the beginning and end rhythmically. Again, the ‘āy’ sound occurs twice with *uchhāle* and *girāye*, as well as the obvious play on similar structuring with *tāj* and *takht* starting with similar ‘ta’ sounds.

دونوں نمونے نہایت ہی واضح طور پر پیش کئے جاتے ہیں تاکہ ان نفوس کے لئے نمونہ ہو ، جو اس دنیا کی زندگی کی فانی اقدار کے دلدادہ ہیں اور ان لوگوں کے لئے بھی نمونہ ہو جو اللہ کی رضا اور آخری اور اقدار کے دلدادہ ہیں اور یہ کردار دونوں قسم کے لئے ایک انسانی نمونہ ہیں جو شخص دو باغوں کا مالک ہے اور دنیا داروں کا نمونہ ہے ، جسے دولت اور ثروت مدبوش کر دیتی ہے اور سازو سامان دنیا اسے سرکش کر دیتا ہے اور وہ اس قوت قابرہ کو بہلا دیتا ہے ، جو لوگوں اور ان کی تقدیر کی مالک ہے۔ ایسے لوگ یہ سمجھتے ہیں کہ ان کی یہ دنیا داری دائمی ہے اور اس کے لئے کوئی فنا نہیں ہے اور اس شخص کا ساتھی اہل ایمان کے لئے ایک نمونہ ہے ، ان لوگوں کے لئے جن کو اپنے ایمان پر فخر ہوتا ہے ، جو بروقت اپنے رب کو یاد کرتے ہیں۔ وہ دیکھتے ہیں کہ ان نعمتوں کا بھی کوئی خالق ہے اور ہمارا فرض ہے کہ ہم اس کی حمد و شکر بجا لائیں ، اس کی ناشکری نہ کریں اور انکار بھی نہ کریں۔ قصے کا آغاز دو ‘باغوں کے بیان سے ہوتا ہے کہ وہ کس قدر قیمتی اور سر سبز باغ ہیں۔

عجیب و گہرا گہرا اک مشیر کی راب سابل اک رپوا اک نینعی : *Bayan-ul-Quran* adds the following: اگوہ اک مشیر ے شوم سابل اک

21. Translation provided by Muhammad Taqi-ud-Din al-Hilali & Muhammad Muhsin Khan. Per *Maarif-ul-Quran*, “The word: جاوزا (azwaj) as used here includes the Hurs روج of Jannah as well as wives of the mortal world.”

22. Translation provided by Muhammad Taqi-ud-Din al-Hilali & Muhammad Muhsin Khan. Per *Maarif-ul-Quran*, “The word rush is the plural of firash which means ‘bed, couch, mattress’. The word marfu’ah lexically means ‘upraised, elevated’. The couches could be upraised or elevated for one of several reasons: because the place itself is high; because the mattresses will not be on the ground, but on the thrones or beds; or because the couches themselves will be thick (and of high quality). Some exegetes have taken the word ‘rush’ in the sense of ‘women’, because it is one of the meaning of ‘firash’ is referred as firash, as in the Prophetic Tradition *شَارِفَالْ دُلُولَا*. ‘The child belongs to the firash’. The word firash refers to ‘wife’. This is corroborated by the characteristics of the women of Paradise described in the forthcoming verses. In this case, the word marfu’ ah would mean ‘high-ranking’.” *Fi Zilalul Quran* gives the following view:

یہاں ان کی نرمی اور ان کی ترتیب کا ذکر نہیں کیا گیا بلکہ یہاں صرف یہ ہے کہ اونچی نشست گاہیں۔“ اونچے کے دو معنی ہوتے ہیں ، مادی اور معنوی ، دونوں ایک دوسرے کے ساتھ لازم ہیں۔ اونچا مکان تو ہو وہ پاک بھی ہوگا اور وہاں گندگی نہ جمع ہوگی اور معنوی رفعت بھی ناپاکی سے دوری ہے۔ اونچی نشست گاہوں میں پھر بیٹھا ہوا کون ہے ؟ ”اس لئے یہاں بیویوں کا ذکر ہوتا ہے۔“

Bas nām rahegā a Allah kā aa (Only Allah’s name will remain) references a time in Islamic beliefs that will come after the *fitnah* (strife) of *Dajjāl* (the antichrist), wherein only the name of Allah will prevail in the land. Of the 99 known names of Allah as mentioned in the Quran, Faiz chooses to reference the Urdu equivalents of four of them. These are particularly noteworthy as unseen alludes to how belief in Allah is supremely important, and that he lies on a throne above that of the worldly oppressors. Ubiquitous draws on the Asharite belief of Allah’s omnipresent nature and then further corroborates it with how he can see everything, having the vision. This showcases that the world is a test and trial where a period of accountability will befall all peoples, even those who claim to be god-conscious yet consider themselves *khuda* (god) while only Allah is worthy of being worshiped and adored. In Arabic, *ilahi* refers to God, while Allah is the supreme and ultimate name for the Muslim belief of God. Faiz uses Allah as a metaphor for truth and justice, signaling that it will present eternally once oppression is lifted from the people. He emphasizes that while people can not hope to see justice (it is *ghaayab*), they can manifest it and see its attributes and that it is still somewhere (*haazir*). It is particularly interesting that Allah is used here instead of God, and it seems to draw on Islamic versions of *tahlil* and the *shahada* (testimony of faith). Abu Huraira is reported to have claimed that the Prophet Muhammad said: “He who uttered these words: “There is no god but Allah, the One, having no partner with Him. Sovereignty belongs to Him and all the praise is due to Him, and He is Potent over everything” one hundred times every day there is a reward of emancipating ten slaves for him, and there are recorded hundred virtues to his credit, and hundred vices are blotted out from his scroll, and that is a safeguard for him against the Satan on that day till evening and no one brings anything more excellent than this, except one who has done more than this (who utters these words more than one hundred times and does more good acts) and he who utters:” Hallowed be Allah, and all praise is due to Him,” one hundred times a day, his sins are obliterated even if they are equal to the extent of the foam of the ocean.”²³ Another excerpt from Muwatta Malik reinforces this point, “Yahya related to me from Malik from Ziyad ibn Abi Ziyad from Talha ibn Ubaydullah ibn Kariz that the Messenger of Allah, may Allah bless him and grant him peace, said, “The best dua is dua on the day of Arafa, and the best thing that I or the Prophets before me have said is ‘There is no god but Allah, alone, without any partner’ (La ilaha illa’llah, wahdahu la sharika lah)”’.²⁴ In the *shahada*, Muslims explicitly state that there is no God but Allah, using *ilah* and *Allah* separately, with the former being the equivalent of the Urdu

23. Sahih Muslim 2691, Book 48 Hadith 38 -- USC-MBA web English reference: Book 35, Hadith 6508

24. Muwatta Imam Malik Book 15, Hadith 504 -- USC-MBA web English reference: Book 15, Hadith 32

khudā.²⁵ *Kaḥfiyā* and *Radīf* are present with the repetition of *bhī* and the similar sounds of *hāzīr* and *nāzīr*, with the overall structure of the two *misr* (lines) being similar to a high degree.

The next two lines are amongst the most controversial within Islamic discourse, due to the use of ‘*An-al-haq*’ (I am the Truth) which lays a claim to a godly attribute in a human. In traditional Islamic belief, only Allah knows the ‘Truth’ and represents it through his justice, something humans can not hope to achieve. *Al-Ḥaqq* is one of the ninety nine known names of Allah, and is reported to be amongst the most famous *shaths* uttered.²⁶ Abū ‘l-Muḡīth Al-Ḥusayn bin Maṣṣūr al-Ḥallāj, otherwise known as Mansour Hallaj, or simply Hallaj, is reported to have said it in the mosque of Caliph Al-Mansur, with other accounts claiming he said it in consultation with Junayd al-Baghdadi.²⁷ In popular imagination, the saying has become intertwined with his execution, despite the other political and social causes and intrigue of the time, due to biographer Abū Ḥamīd bin Abū Bakr Ibrāhīm including it in his works.²⁸ Other controversial lines by Hallaj include: “There is nothing wrapped in my turban but God”, “*Mā fī jubbatī illā l-Lāh*” (There is nothing in my cloak but God) while allegedly pointing to his cloak, and a saying,

I saw my Lord with the eye of the heart
I asked, ‘Who are You?’
He replied, ‘You’.

25. *lā ‘ilāha ‘illā -llāh*^u (لَا إِلَهَ إِلَّا اللهُ), meaning “There is none worthy of worship except Allah”

26. A *shath* (Arabic: سَاطِئٌ *ṣaṭṭ*, plural: *ṣaṭṭahāt* or *ṣaṭṭhiyyāt*) within the Islamic traditions of Tasawwuf, mysticism, is an ecstatic utterance characterized for being largely outrageous or borderline blasphemous in nature. The word itself comes from an Arabic root of ṣ-t-ḥ which omits the sense of extreme outpouring of emotion, such as wailing, due to sadness or agitation. It is similar in respect to the etymology of *Ghazal*, a type of Urdu poetry, being the namesake of the mortal shriek that comes from a deer as a prey catches upon it. Some famous *shathiyat* include Bayazid Bastami’s expression, “Glory be to me, how great is my majesty”. Certain Ṣūfī writers have at times claimed that *shath* were a result of states of madness or intoxication, or wrongly attributed in mistranslations or misinformation to certain individuals who were otherwise hailed as pious figures. Al-Ghazali for example displayed a degree of ambivalence regarding the blasphemous nature of some of these utterances, all the while admiring and acclaiming the spiritual piety of those who said them. The prime of *shath* happened during the traditional time of Ṣūfism from the 10th to twelfth century AD (the third to 6th century AH). The chief Ṣūfī translation of the *shathiyat* which appeared as “I am” expressions differentiated the lastingness of God (*baqā’*) with the magical obliteration of the singular self image (*fanā’*), which made it feasible for God to talk through the individual. They later figured as topoi of Persian Ṣūfī verse (particularly that of Farid al-Din Attar) prior to being decreased by later Ṣūfīs to simple moral stories for Ibn Arabī’s way of thinking.

27. Basra grammarians claimed the account of having said it in Al-Mansur’s mosque, and are critiqued for having apparently maintained a bias due to the emerging political climate of the time.

28. Abū Ḥamīd bin Abū Bakr Ibrāhīm’s pen names are Farīd ud-Dīn and Aṭṭār of Nishapur (*aṭṭār* meaning apothecary).

Hallaj's saying has persisted and perplexed Sūfīs and the followers of various orders throughout the centuries, and has been associated with a cry of revolution and plight during an era of like-minded authoritarianism and the crushing of any forms of dissent. He promoted a search for the loving union between God and the human soul, with his mystical inclinations resulting in his summary detention and execution. Narratives of his plight have been found in literature spanning the Persian, Ottoman Turkish, Urdu, Pashto, Punjabi, and Sindhi languages. His conflict with state authorities, namely the Abbasids, is widely reported due to allegations levied against him that he viewed himself as an incarnation of God. Thus, he was considered to be an agent of a revolutionary movement, some considering it akin to the ultranationalism of the Mu'tazilites and others to Greek occidentalism, during a period of political crisis in the second major dynastic Islamic caliphate. Opinions regarding him have ranged from full acceptance and ready canonization of his statements to exclusionary practices and outright condemnation. Faiz uses the *naara* (call, cry) of 'An-al-*haq'* to draw on the common Sūfī backgrounds of the Barelvi-inclined masses of Pakistan to come together as being of an inextricable common lineage by virtue of being God's creation.²⁹ It calls for a populist revolution, instead of everyone acting as independent agents in the pursuit of their own desires and acting on their whims. There is no shortage of legends describing stories associated with *anā al-ḥaqq*. One such account claims that Hallaj knocked on the door of his famous teacher, Junayd al-Baghdadi and in response to being questioned on who was there used the phrase, "I am the truth". Baghdadi disapproved of the use according to this account. Other reports, by later Sūfīs, suggest Hallaj used the phrase to annul himself and maintained the support of his students and disciples, with political opponents going after him and fabricating heresy against him. 'Aṭṭār writes that Hallaj continued to say "I am the truth" even after being executed, as a mystical spirit resonating the truth as his ashes are scattered in the Tigris River. South Asian literature is also filled in excess in Urdu and Punjabi with references to this, with Iqbal himself considering Hallaj a role model for Muslims seeking liberation. Aurangzeb is also noted to have executed Sarmad for saying this *n'ra*, which was viewed as anti-Islamic by regressive outlooks on the political and social sphere. In a style emulating Khalil Gibran, Vaikom Muhammad Basheer wrote a short story on Mansour's life known as *Ana Al-Haqq*.³⁰ In it

29. A *naara* is a call, such as *narae-takbeer* referencing a call to cry *Allahu-Akbar* (God is Great).

30. In a 1982 edition of *Anargha Nimisham*, a collection of short stories written by Basheer originally published in 1946, a note was added by the author saying "This story was written some forty years back. Now I believe that ordinary human beings who are just the products of the Almighty saying things like 'I am God' is a sin. I had also claimed that the work is based on a real story, but now; take it just as a fantasy." Many have noted the marked change in attitude, attributed by some towards added religiosity towards the end of his life wherein he contradicted

Basheer draws a parallel between Anā al-Ḥaqq and *Aham Brahmasmi*, the *Upanishad Mahāvākya*, which roughly translates to ‘I am Brahma’ (the Ultimate Reality in Hinduism). There are also some noticeable similarities with the Latin phrase, “Via et veritas et vita” (the way and the truth and the life) allegedly spoken by Jesus in reference to himself.

The repetition of *jo maiñ bhī hūñ, aur tum bhi ho* is again present in the last two stanzas by Faiz as a way to emphasize the general people’s role in fermenting a revolution. *tum* is also used instead of the Persian-derived *āp*, which denotes a higher degree of respect, signifying there is no formality between the people who will topple authoritarianism and those who put themselves on *but* (pedestals).

Rāj here once again refers to a populist appeal, akin to British India being referred to as the British Raj, a Hindi-word denoting rulership. *Ḳhalq-e-ḳhuda* literally means the creation of God, and is found as a phrase in the works of other prominent poets attempting to convey this revolutionary language.³¹

Conclusion

In essence, Faiz begins creating a world in this poem that is not in control of its destiny, in rejection of the prevailing Western European norms of individualism. God and spirits have agency here, as the revolution is predicted in an eternal tablet and can not be altered regardless of the futile attempts of humans. Attempts to read Faiz’s works, which clearly are acting as a metaphor and call for political change, can not be simplified to just that as it would remove the essential components to the discourse of the society from which he writes in. In a renowned essay published in 1986, “Third World Literature in the Era of Multinational Capitalism”, Fredric Jameson emphatically states that failing to keep a keen eye on the “language and idiom and respect for their grafting [would bind people] to the inevitable themes of tradition and modernity, collectivity and individualism” which clearly are present (Spivak 2003, 26). The plunge of Faiz’s discourse is Islamic imagery, a cultural aspect of the Muslim-majority society he was raised in, and the lens through which he writes to promote an individualistic, yet equally collectivist narrative. In many ways, he is similar to Iqbal in that he attempts to awaken the modern political conscious by drawing

some of his earlier works. Nevertheless, even this note was supplemented with an ending *Anā al-Ḥaqq*, akin to the recurring protagonist of the story.

31. Abu Muhammad Sahar writes, “marzī ḳhudā kī kyā hai koī jāntā nahīñ kyā chāhtī hai ḳhalq-e-ḳhudā ham se pūchhiye”. Waliullah Muhib writes, “tamām ḳhalq-e-ḳhudā zer-e-āsmāñ kī samet zaiñ ne khaa.ī va-lekin bharā na us kā pet”. Even Haidar Ali Aatish has a reference to it in the following manner, “sun to saḥī jāhāñ meñ hai terā fasāna kyā kahtī hai tujh ko ḳhalq-e-ḳhudā ghā.ebāna kyā”.

on the established tradition of Sūfīs and Islam. Such is the reason why he is able to express Hallaj’s truth, which lives on in the “heart of every atom and every drop of water” of those who profess ‘*anāil-Ḥaqq*’ (Schimmel 1996, 75). While the ideal form of government is not spelled out literally in this poem, enough allusions are made to suggest it is one by the people and for the people, democracy at its finest. Yet a precapitalist and premodern undertone is also present, with the relative relationship and location of a man in God’s world being talked about. The Marxist inclinations of Faiz are embodied in the framework of an authentic Islamic lens, crossing the boundaries of jurisprudence and tradition, to formulate a piece that may as well have been written by a firm believer of Pan-Islamic unity and the restoration of a Caliphate. Faiz leaves a mystery that the likes of Javed Akhtar are simply left dissecting, given the interpellation posed by the poet offers different routes of engenderment depending on the setting, be it Iqbal Bano’s 1986 Lahore theater or Delhi-based Indian civil rights activists in 2020. Secular Marxist principles are disavowed, and no room is left for the formation of a Cartesian individual who is firm in their sovereignty due to having mastered the liberal Western themes and traditions (Shahid 2013, 16). Foucault’s charge that Marxism aids in the reproduction of such a thought process is rejected in this synthesis emerging distinctly from the bedrock of Islamic civilization. The far reaching dream of a humanist revolution is coaxed with the plural *ham* (we) being used in the imaginative thought of a future devoid of pain and suffering based on an eternal revolution. The very confines of the ontological understanding of the world is laid to bare as destiny is written on an eternal tablet by higher beings propelling worldly forces into action. In this manner the *nazm* is able to make way for a postcolonial, innovative narrative and creative mind, a misplaced heterotopic *lieu de mémoire* that formulates a grassroots approach to the development of a national memory and heritage.³² Europeans and Islamists are quick to ascribe labels to Faiz, that of a Marxist, progressive, or leftist, to bottle down an array of views into one paradigm. Such ignorance fails to acknowledge his distinct and praiseworthy ability to bring the dough out to bake the recipe of a new front of nuanced revolution. The textuality and feel of his verse alongside the chronicled esteem it portrays is lost in such reductionist accounts, and its cosmopolitan nature is all but disregarded. *Ham dekheñge* goes beyond the confines of the imaginations of a postcolonial writer, and draws on the issues of class, nationhood, and religion in a unique manner that befits the prevailing narratives in South Asia. Historicity and the wholesale historical account from which it is derived from can not be pretermitted, as it emerges

32. Pierre Nora’s definition of *lieux de mémoire* is a group in which a “residual sense of continuity remains” (Pierre 1996, I). Nora further contends that memories constitute a phenomenon for the present to gaze at, i.e. notions, myths, and legends that constitute the shared consciousness of a people identified by cultural similarities.

from the world of the Orient, the Islamic East's own awakening. The adoption of a Western lens - whose homogeneity is present in literature - or that of other civilizations, like Hindu as done by right-wing nationalists in India, denies this poem the existing parallel space it deserves. Otherwise, it too will be silenced under the universality-approach of Western ideals instead of being seen for the integration of culture and religious thought that it is.

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جب ظلم و ستم کے کوہِ گراں
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 ہم محکوموں کے پاؤں تلے
 یہ دھرتی دھڑ دھڑ دھڑکے گی
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بس نام رہے گا اللہ کا
 جو غائب بھی ہے حاضر بھی
 جو منظر بھی ہے ناظر بھی
 اُٹھے گا انالحق کا نعرہ
 جو میں بھی ہوں اور تم بھی ہو
 اور راج کرے گی خلقِ خدا
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 ہم دیکھیں گے
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 ہم دیکھیں گے

Hum dekhenge
 We shall see
Laazim hai ke hum bhi dekhenge
 Inevitably, we shall also see the day
Woh din ke jiskaa waada hai,
 that was promised to us,
Jo lau-e-azl mein likha hai
 decreed on the tablet of eternity.
Jab zulm-o-sitam ke koh-e-garaan
 When dark peaks of torment and
 tyranny
Rooi ki tarah udd jaayenge,
 will be blown away like cotton fluff
Hum mehkoomon ke paaon tale
jab dharti dhad dhad dhadkegi,
 When the earth's beating, beating
 heart,
 will pulsate beneath our broken feet;
Aur ahl-e-hukam ke sar oopar
Jab bijli kad kad kadkegi,
 When crackling, crashing lightning
 will smite the heads of our tormentors;
Jab arz-e-khudaa ke kaabe se
Sab but uthwaay jaayenge,
 When, from the seat of the Almighty
 every idol will lie displaced;
Hum ahl-e-safaa mardood-e-haram
Masnad pe bithaaey jaayenge.
 Then, the dispossessed we; we,
 who kept the faith will be installed
 to our inalienable legacy.

Sab taaj uchaaley jaayenge.

Sab takht giraaey jayyenge.

Every crown will be flung.

Each throne brought down.

Bas naam rahega Allah kaa,

Jo ghaayab bhi hai, haazir bhi,

Jo manzar bhi hai, naazir bhi.

Only Allah's name will remain; He,
who is both unseen, and ubiquitous;

He,

who is both the vision and the
beholder.

Utthegaa 'An-al-haq' kaa naara

Jo main bhi hoon, aur tum bhi ho,

When the clarion call of 'I am
Truth',

the truth that is me and the truth
that is you will ring out,

Aur raaj karegi Khalq-e-Khuda

Jo mai bhi hoon, aur tum bhi ho.

all God's creatures will rule,
those like me and those like you.

Hum dekhenge

We shall see

Laazim hai ke hum bhi dekhenge

Inevitably, we shall also see the day

Hum dekhenge

We shall see

BALANCING THE SAINTS: AN ANALYSIS OF THE INCLUSION OF DIVINE INTERCESSORS

MALVIKA PANDYA

The resulting art from the period of the Black Death and the time following it is deeply indicative of the general population's emotions at the time as they faced fear and sickness. Much of the art produced in response to the plague is religious in nature, yet the specifics of the saints and scenes portrayed varies vastly through time and geographic locations. Though the depiction of Saints Roch and Sebastian were common, local saints also appeared in several works. In this essay, I perform a closer inspection of four separate paintings, and argue that the inclusion of common and local saints were used to create a cumulative effect of protection for a patron or city.

The Black Death's overwhelming effects were felt throughout Europe as an astonishing portion of the population experienced its devastation. Because this wave of plague was so widespread and severe, it almost served as a universal experience that would be relatable to any person at the time. This universal experience mirrors the use of universal plague saints Roch and Sebastian, who were considered to be the most well-known and specific intercessors of the plague, given their direct relation to the disease. Because these saints were well-established in their power, a plea to St. Roch and St. Sebastian may have been considered to be the fastest path to salvation, something desperately needed by many at the time, resulting in the abrupt rise of plague saint popularity. However, during the later outbreaks, various cities experienced spreads at different time intervals, and although these outbreaks occurred less often, they were usually intensely catastrophic. These city-specific plagues may have been viewed as punishment from heaven for the actions of the town and the people within it, possibly leading to increased invocation of local saints in hopes of protection. Local saints were proposed by the consensus of their respective communities, largely in response to the nominated saint's history of performing miracles, especially those that

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concerned medical healing or cures¹. If approved by the town, a cult of the local saint could subsequently form and “. . . provide it [the town] with monetary benefits, social prestige, and spiritual patronage . . . [and] unify the community by prompting ritual devotion on a larger scale”². Despite the fact that these local saints could have been considered to be less powerful than conventional saints, their benefit may lie in the extreme loyalty they retain for their city and their ability to plead fiercely on behalf of the city for its salvation. Although the inclusion of local saints is widespread throughout plague art, they were seen as less powerful than universal plague saints, but the unique ability of patron saints to argue for a specific city led to their rise in popularity for use in civic spaces. However, this technique was not employed until later plague outbreaks that occurred in the 16th-17th century. For this reason, it may have been considered more effective to combat early plague outbreaks with the inclusion of multiple saints or more powerful saints in the use of ex-votos and plague artwork.

Although St. Sebastian has no explicit connection to the plague, his popularity as a plague saint is largely due to his status as a martyr. The *Passio Sancti Sebastiani*, a scripture containing the story of Sebastian’s life and subsequent sainthood, claims that “. . . Sebastian was a member of the elite Praetorian guard under the Emperors Maximian and Diocletian; though a Christian, Sebastian kept his faith a secret in order to use his military status to help imprisoned Christians”³. After his true faith was discovered, he was sentenced to death and shot with an excessive number of arrows, after which his Christian counterparts found his dying form and were able to revive him. With a new chance at life, Sebastian once again incurred the wrath of the emperor due to his defense of Christians, resulting in his death sentence, which was more successful than his last⁴. However, “. . . a subsequent apparition by Sebastian to yet another Roman matron revealed the location of his body . . . [and] Sebastian’s recovered body was given proper burial”⁵. Given the connecting imagery, the same arrows that pierced Sebastian’s skin as a punishment for his faith in Christianity took on a new meaning in plague times, instead mirroring the arrows that are representative of God’s wrath towards the people in the form of plague. Even with this vague association, Sebastian’s real power comes from his status as a martyr, which were “. . . fellow human beings who, precisely because of their death, now enjoyed intimacy with God. And through that intimacy came their power

1. J. Peterson, *Suspect Saints and Holy Heretics: Disputed Sanctity and Communal Identity in Late Medieval Italy*, 23–24 (2019).

2. Peterson, 28.

3. F. Mormando, Introduction: Response to the Plague in Early Modern Italy: What the Primary Sources, Printed and Painted, Reveal. *Hope and Healing: Painting in Italy in a Time of Plague, 1500–1800*, 30 (2005).

4. Mormando, 30.

5. Mormando, 30–31.

to intercede with God on behalf of their devotees”⁶. By worshiping St. Sebastian, his followers recognized his sacrifices mirrored by those of Christ in hopes of receiving second-handed sympathy from God.

In direct contrast to St. Sebastian, St. Roch had a direct connection to the plague, which helps to more clearly explain his rise in popularity at the time. According to the detailed biography of St. Roch in the *Acta Braviora*, “. . . embarked on a pilgrimage to Rome during his early adulthood. Enroute, he passed through several cities in northern and central Italy stricken by plague and effected a series of miraculous cures”⁷, already establishing his power of protection over the plague, which was further strengthened when Roch himself fell ill to the plague, yet managed to survive. He was later falsely arrested on charges of spying and spent five years in prison, but “At his death he was granted the power to save others from the plague by divine fiat”⁸. Given his explicit power to protect from the plague, Roch’s following dramatically increased in size during the various plagues between 1477–1479, finally reaching true height when the governor of Venice created a new chronology in which “. . . Diedo provides the exact words: ‘Those suffering from the plague, fleeing to the protection of Roch, will escape that most violent contagion’ ”⁹. Roch, unlike Sebastian, is typically shown healing people and his piety and survival may have been what drew people towards him in hopes of securing their own means to survival.

The use of local saints also gained prominence during the numerous plague outbreaks in Europe at the time, but by no means were they a novel innovation. City saints had been used in the past to defend the city against any forms of hardship, whether it be famine or natural disasters, and their protection was hoped to extend to sickness as the plague carried on. It was thought that the veneration of local saints would ensure salvation of their city given their strong devotion towards their city. Louise Marshall emphasizes this point, claiming “Local patron saints were often the first line of supernatural defense for many communities, because they were bound to their city by special ties of affection and interest and could be relied upon to plead its cause with all the vigor and passion of a citizen on an urgent embassy to a foreign dignitary”¹⁰. There were caveats to the powers of the local saints, however, as they remained low in the hierarchy of divine intercessors. It is typically considered that the local saints would have prayed to more powerful and well-established saints, in hopes that

6. L. Marshall, Manipulating the Sacred: Image and Plague in Renaissance Italy. *Renaissance Quarterly*, 47, 493 (1994).

7. Marshall, 502.

8. Marshall, 502.

9. Marshall, 504.

10. L. Marshall. Plague Literature and Art, Early Modern Europe. *Encyclopedia of Pestilence, Pandemics, and Plague* 1, 525 (2008).

their conjunctive prayers would be enough to draw the sympathy of the Virgin Mary and/or God on behalf of the town's citizens. This hierarchy of sorts may sometimes be depicted through the intentional positioning and sizing of divine figures within religious plague art.

St. Sebastian was a popular subject of art during plague times as a form of worship, as demonstrated by Pietro Perugino's wood panel painting, *Martyred*



Fig. 1: Perugino, P. (Ca. 1450–1523). Saint Sebastian [oil on wood panel]. Borghese Gallery, Rome, Italy. <https://borghese.gallery/collection/paintings/st-sebastian.html>

Sebastian, created in the late 1400s (Fig. 1). As was the trend at the time of the Quattrocento, Sebastian is pictured alone, standing underneath an ornate archway with his hands tied behind his back. This trend is marked by a “. . . lack of narrative action: the archers are either inactive or, more usually, absent. Focus has shifted from the dramatic moment of the martyrdom, when the executioners deliver a volley of arrows and crossbow bolts into the martyr’s flesh, to an isolated representation of the suffering saint”¹¹. Although his body is pierced with two arrows, Sebastian appears unbloodied, seemingly unaffected by the pain inflicted upon him by his executioners. He wears a simple loincloth, bringing attention to the sculpted planes of his body, evoking from the viewer a sense of godliness and ethereality, an assumed deliberate choice by Perugino, who is presumably following the popular depictions of St. Sebastian as “. . . a young, handsome, athletic hero, usually naked or nearly so”¹². His gaze is directed upwards, perhaps looking towards heaven and embracing his newly found divinity, marked by the faint halo around his golden curls.

The depiction of St. Sebastian’s suffering and body position by Perugino summons a mirror image of Christ hanging upon the Cross, both meeting their end as a result of their role as a sacrificial lamb, paying for the sins of humanity. Marshall asserts that “The essential meaning of the image lies in its proffering of Sebastian’s pierced yet living body before the worshiper’s gaze”¹³, serving as a powerful inspiration for a viewer to instill humility and piety within themselves as they gaze upon the great sacrifice of St. Sebastian. Although a grim representation, “. . . the image of Sebastian, martyred and yet alive, celebrates his resurrection as proof of his inexhaustible capacity to absorb in his own body the plague arrows destined for his worshipers”¹⁴. His martyred yet peaceful body serves as both a hope and reminder to his followers as they must directly consider the source of their protection and the cost from which it came.

A primary example of St. Roch’s typical depiction at the time can be seen in Jacopo Bassano’s *St. Roch Visits the Plague-Stricken*, painted in 1575 (Fig. 2). The painting depicts the Virgin Mary in her divine form at the top of the painting, marked by one of the few vibrant colors in the work, wearing a pink and blue garb and bathed in a heavenly yellow light, contrasted by the dark and swirling clouds surrounding her. These clouds are being grasped by angel figures, who seem to be struggling to open a chasm in the sky in order for Mary to appear. In the lower half of the painting appears St. Roch, also painted with bright colors, surrounded by victims of the plague, some laying at his feet while others are

11. L. Marshall, *Manipulating the Sacred: Image and Plague in Renaissance Italy*. *Renaissance Quarterly*, 47, 496 (1994).

12. Mormando, 31.

13. Marshall, 496.

14. Marshall, 500.



Fig. 2: Bassano, J. (1575). *St. Roch Visits the Plague-Stricken* [oil on canvas]. Pinacoteca di Brera, Milan, Italy. <https://pinacotecabrera.org/en/collezione-online/opere/san-rocco-visita-gli-appetati/>

standing and bent over. He appears to be in discussion with a woman who may be beseeching him to help her or the child beside her, as St. Roch is making a hand gesture that may be interpreted as blessing or performing the last rites.

Mary appears to be bestowing her blessing upon St. Roch, as one hand reaches down towards him while the other is directed towards the heavenly

light, a choice that literally reflects her role as a heavenly intercessor, a living channel through which people could pray for help from Christ or God. The significance of color is apparent here as both central figures in the painting are emphasized via the brighter colors with which they are portrayed, while the rest of the painting is composed of dull, muted tones. This gives a sense of despair and hopelessness that is only broken by the figures of St. Roch and the Virgin Mary, whose bright apparel is meant to signify their divinity and the glow of

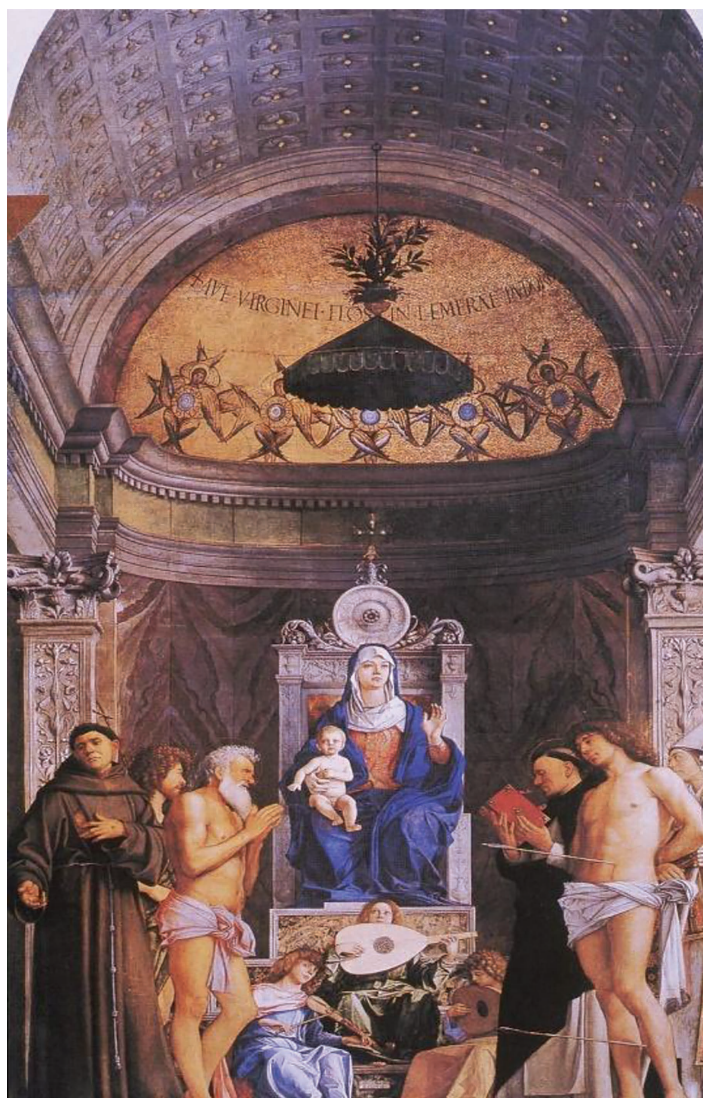


Fig. 3: Bellini, G. (1516). San Giobbe Altarpiece [oil on wood panel]. Gallerie dell'Accademia di Venezia, Venice, Italy. <https://www.gallerieaccademia.it/madonna-col-bambino-trono-angeli-musicanti-e-i-santi-francesco-giovanni-battista-giobbe-domenico>

their blessing. Serving as proof of his survival of the plague by the mercy of God, “Roch’s ritualistic presentation of his ‘wound’ secures, indeed compels, divine favor on behalf of his worshippers”¹⁵. Bassano’s depiction of St. Roch strengthens such an image, one meant to portray a beacon of hope to the frightened and suffering people at the time.

These solo saints are contrasted by Giovanni Bellini’s *San Giobbe Altarpiece* (Fig. 3), in which both local saints and popular plague saints were given recognition. Although the church that housed this altarpiece was dedicated to Venetian patron saints Job and Bernardino, this altarpiece chooses only to include Saint Job as a sort of compensation, given that most of the church’s visual arts focused on St. Bernardino¹⁶. The altarpiece is set inside the church, as Mary, with baby Christ on her lap, sits on an elaborate throne while three angels play instruments at her feet. The Virgin Mary is surrounded by St. Francis, John the Baptist, Saint Job, Saint Sebastian, Saint Dominic, and the bishop Louis of Toulouse. What remains unique about Bellini’s work on the altarpiece is his intentional stylization of each individual saint in order to give them a specific purpose that serves to improve the effectiveness of the work in procuring protection from the plague. The inclusion of “. . . Dominic and Francis embody two *exemplum virtutis* of faith, the one expressed by his pious study of the sacred texts, and the other an emotional spirituality that urges our compassion for the Passion of Christ”¹⁷, and given the injuries of Francis, he “. . . is our irresistible intermediary whose prayers on our behalf cannot be denied precisely because he displays the same wounds as the Crucified Christ, miraculously inflicted by Christ himself”¹⁸. By choosing which saints to portray in their idealized version, Bellini could be creating a specific formula in order to maximize persuasion by playing into the empathies of the divine. This again is seen in the inclusion of the other saints in the altarpiece, as “Francis, Louis of Toulouse and John the Baptist were evidently considered special champions of belief in the Conception . . . [and] By including Dominic in the S. Giobbe altarpiece, Bellini made the saint yet another witness to Mary’s Immaculacy. . .”¹⁹. By implementing saints that had a particular connection to both the Virgin Mary and Christ, Bellini creates an association between these saints and more commonly worshiped religious figures that work to promote saintly worship. Specific plague saints are also depicted on the altarpiece, “. . . both Job and Sebastian were considered efficacious intermediaries against the plague”²⁰. It is worthwhile to consider the implications of both saints

15. Marshall, 506.

16. R. Goffen, Bellini, S. Giobbe and Altar Egos. *Artibus Et Historiae* 7, 62 (1986).

17. Goffen, 60.

18. Goffen, 60.

19. Goffen, 66.

20. Goffen, 65.



Fig. 4: Reni, G. *Madonna with the Patron Saints of Bologna* [oil on silk]. Pinacoteca Nazionale, Bologna, Italy. https://www.pinacotecabologna.beniculturali.it/en/content_page/item/2824-madonna-and-child-in-glory-with-saints-petronius-dominic-francis-ignatius-francis-xavier-proculus-and-florian-protectors-of-bologna-plague-altarpiece-or-great-votive-banner

appearing on the altarpiece, despite serving nearly the same purpose. While St. Sebastian was more widely regarded as a plague saint, the addition of St. Job may have served the purposes of placation, as he “. . . had been deprived of the high altar by Bernardino’s civic cult”²¹. In this altarpiece, the balance almost

21. Goffen, 65.

shifts to convey that Job has significance to the city of Venice, yet the invocation of the other saints was found to be necessary in order to truly ensure that a stronger cry for help is heard by the Virgin Mary and Christ.

One interesting and notable example of the veneration of local saints in hopes of protection from the plague is Guido Reni's *Pallione del Voto*, or Votive Processional Banner (Fig. 4). Reni created this work to be used in Bologna's public procession in 1631 in order to fulfill the plea from the city's senate "... to the Madonna of the Rosary and to Ignatius of Loyola and Francis Xavier, imploring their intercession and offering in return perpetual acts of collective piety"²². On the banner itself, the Virgin Mary is depicted with Christ on her lap as she is surrounded by a bank of clouds with a rainbow underneath her feet, as "Two cherubs prepare to crown the Madonna with a wreath of red and white roses, and three others emerge from the clouds to shower down roses and rosary beads"²³. Beneath Mary and Christ, "... Reni depicted Bologna's patron saints: kneeling from left to right, Petronius, Francis of Assisi, Francis Xavier, and Dominic; and standing, again from left to right, Ignatius of Loyola, Florian, and Proculus"²⁴. Finally, a small cityscape of Bologna is painted at the bottom of the banner. The entire banner grows darker as it reaches the bottom, with colorful and bright divinity shining a small light upon the saints below, and the city remaining dark and gloomy.

The choice to exclude St. Sebastian and St. Roch is an interesting one, given their popularity and intense cult following, all in hopes of salvation. Puglisi remarks that the decision to omit Sebastian and Roch from the painting arose from "... the Reggimento's conscious decision to stress the civic function of the commission"²⁵. The motivation behind this decision is largely unknown, whether the Reggimento believed that venerating their local saints would be more effective as these patron saints would be more likely to argue with the higher powers on Bologna's behalf given their special connection to the city, or if by choosing to honor only the patron saints of Bologna, their appreciation would protect them from future disasters as well. Puglisi believes that "Because the *Pallione del Voto* eschews such traditional intercessors in favor of Bologna's patron saints alone, it translates a general plea for heavenly aid into a partisan call"²⁶, which aligns with the banner's purpose as a plea for help for only the city of Bologna and the specific manner in which the city's buildings are portrayed.

22. C. Puglisi, Guido Reni's *Pallione Del Voto* and the Plague of 1630. *The Art Bulletin* 77, 405 (1995).

23. Puglisi, 404.

24. Puglisi, 404.

25. Puglisi, 409.

26. Puglisi, 409.

When considering the presence of any given saint in plague artwork, it is important to keep in mind the motivations of both the artist and possible patrons of the work. The *San Giobbe Altarpiece* (Fig. 3) and *Pallione del Voto* (Fig. 4) are both marked by careful political deliberation that aims to honor important saints while also staying specific to the city. The two aforementioned works were created for use in civic spaces, so it was important that saints extremely loyal to the city were included. However, the inclusion of multiple saints within these works as compared to the paintings solely highlighting St. Roch or St. Sebastian can be explained by “A characteristic feature of early modern plague imagery [with] the multiplicity of options available for obtaining heavenly protection against the disease. Worshippers could pick and choose from a multitude of celestial defenders”²⁷. By choosing to identify with one saint or another, or instead worshipping a multitude of saints, people suffering under the plague were able to find protection that was tailored to them and their belonging in a specific city. This idea is spurred on by Marshall, believing “Where one saint was powerful, many gathered together were virtually irresistible. This essentially confident, optimistic conviction in multiple means of accessing supernatural protection was fundamental to early modern men and women’s ability to cope with the ongoing presence of plague in their midst”²⁸. This phenomenon does indeed explain the initial widespread use of multiple saints, both local and common saints, as seen in the *San Giobbe Altarpiece* (Fig. 3), but as time went on and plague frequency decreased, the use of this combination also decreased, instead replaced by sole local intercessors praying for the city’s salvation.

While the use of St. Roch and St. Sebastian as distinguished intercessors was extremely prevalent, the two figures served vastly different roles in their inclusion, although both ultimately helped their worshippers procure protection and salvation. St. Sebastian’s martyrdom “. . . by the arrows of the plague becomes a vicarious sacrifice offered up to God. Christ-like, he takes the sins of humanity upon himself and makes restitution for these sins with his own sufferings”²⁹. The images of St. Sebastian in such suffering are meant to offer a window of reflection for the viewer, a hope of salvation for their soul in beliefs that they too will be offered redemption in the same way as Christ and Sebastian. Although St. Sebastian appears in his dying moments with severe wounds decorating his body, he is rewarded for his sacrifice, giving comfort to his worshippers that their pain will also be rewarded in death. The depictions of St. Roch are meant to be more awe-inspiring and optimistic, “. . . the sight of Roch scarred by the

27. L. Marshall. Plague Literature and Art, Early Modern Europe. *Encyclopedia of Pestilence, Pandemics, and Plague* 1, 525 (2008).

28. Marshall, 525.

29. L. Marshall, Manipulating the Sacred: Image and Plague in Renaissance Italy. *Renaissance Quarterly*, 47, 495 (1994).

plague yet alive and healthy must have been an emotionally charged image of promised cure. Here was literal proof that one could survive the plague, a saint who had triumphed over the disease in his own flesh"³⁰. St. Roch was an anomaly, but one welcomed joyously as people triumphed in the fact that survival was possible, that their bodies were capable of fighting this disease in a similar fashion to the saint. As long as they continued to worship and favor Roch, there was hope that the ill would receive the same compassion Roch had received from God.

Given the intense religious fervor at the time of the plague, it was natural that the invocation of saints would be varied throughout different time periods and locations. The common fear of invoking further divine wrath and bringing plague upon a city forced artists and city leaders to consider the implications of honoring some saints while omitting others, leading to a careful balance of divine intercessors that would most benefit the viewers of the work and procure definite protection. While some civic works were meant to procure salvation for the city collective as a whole, more contemplative works featuring Roch and Sebastian were also effective in moving the viewer and offering them various versions of comfort in trying times. Worshippers may have looked toward St. Roch as a source of salvation while they were alive, whereas St. Sebastian offered comfort after suffering and death. The emotive forces at work within saintly depictions guide viewer worship in order to tug at the heartstrings of divine figures in hopes of bodily and religious salvation.

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30. Marshall, 505.



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