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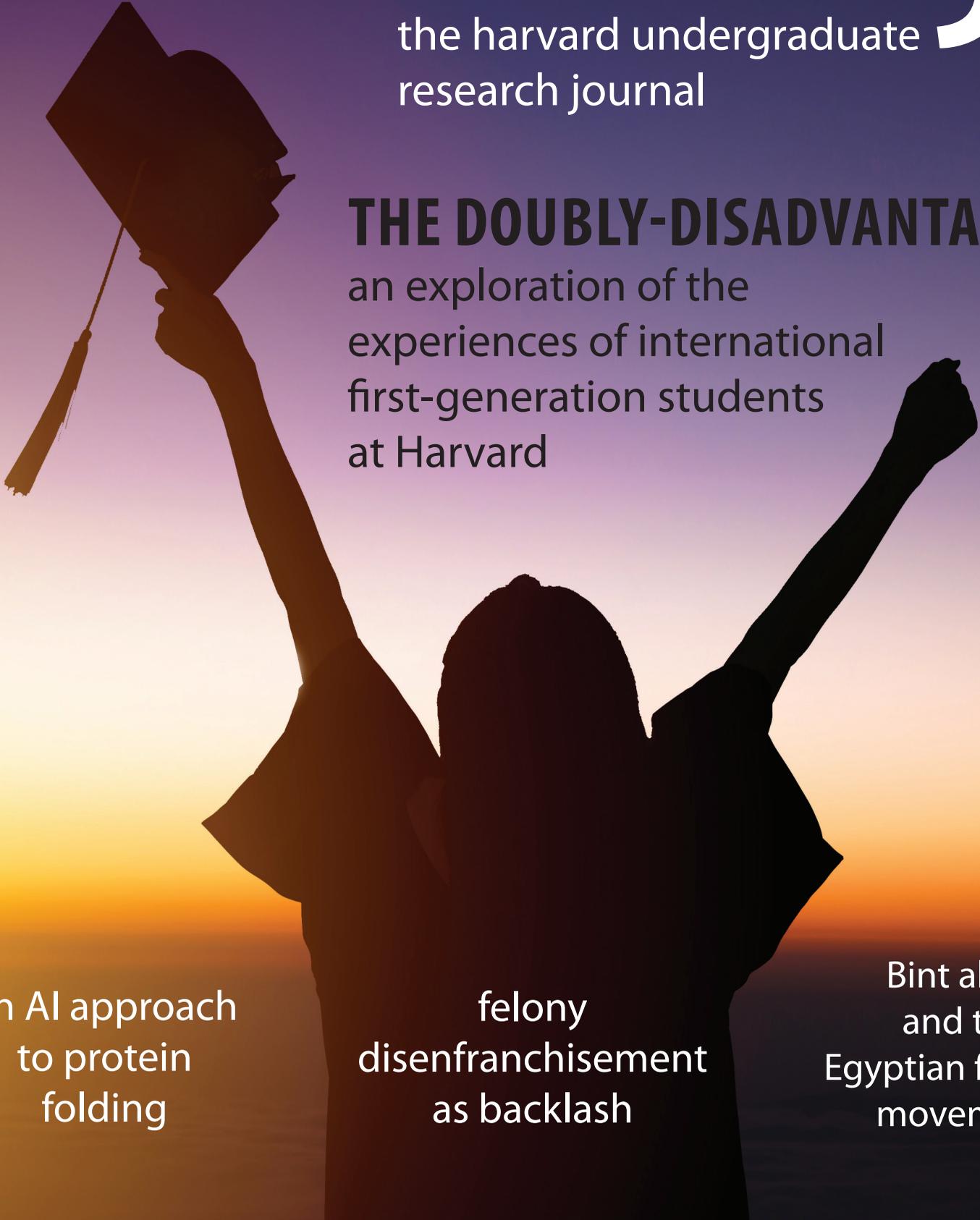
THE DOUBLY-DISADVANTAGED:

an exploration of the
experiences of international
first-generation students
at Harvard

an AI approach
to protein
folding

felony
disenfranchisement
as backlash

Bint al-Nil
and the
Egyptian feminist
movement





Congratulations to
Pablo
Zamorano Díaz
for winning
Best Manuscript

Pablo Zamorano Díaz is a junior Sociology concentrator studying immigration, social inequality, and disparities in access to higher education. He is a native of Chile and focuses most of his research on first-generation students in elite institutions and Latin American immigrants to the U.S. He will be studying abroad in Cairo, Egypt in the fall before returning to campus to finish his senior thesis on the Haitian migration to Chile, for which he has been studying Haitian Creole through the African Language Program at Harvard. On campus he is a barista in Lamont Cafe and a Harvard tour guide. He enjoys traveling extensively throughout Latin America and spending time on the U.S.-Mexico borderlands.

May 2019

Dear Harvard Community,

We are delighted to present the Spring 2019 Issue of The Harvard Undergraduate Research Journal (THURJ), Harvard's sole peer-reviewed student-run biannual publication dedicated to showcasing outstanding research from the Harvard undergraduate community. For the past ten years, we have been proud to publish high-quality, original research from a wide range of disciplines. In this issue, our authors explore topics as far-ranging as felony disenfranchisement and African American voting rights to our understanding of the Neanderthal genome and its evolutionary relationship to modern humans. This year's Best Manuscript award goes to Pablo Zamorano Díaz '20 for his outstanding manuscript that discusses the experiences of first-generation international students at Harvard and proposes solutions to address the challenges that they face. We are also excited to present interviews with Professors David Laibson and Colleen Cavanaugh, esteemed members of the Harvard faculty.

Every year, we work to increase THURJ's visibility in the Harvard community and strengthen our reputation as a professional-quality journal. As in previous semesters, we hosted a research panel this semester aimed at helping students get involved in research with panelists representing a diverse array of disciplines from chemistry to economics. In our efforts to promote undergraduate research, THURJ continues to be a leader in the larger national scientific community by working with research journals at our peer institutions and lending our expertise to help students at schools worldwide establish their own undergraduate research journals.

This work would not be possible without the incredible insight, dedication, and support of our faculty advisory board. We would like to thank our student and faculty reviewers, staff writers, and designers for their immense efforts in creating, editing, and polishing this issue. We would also like to extend our unwavering gratitude to our faculty advisor Professor Guido Guidotti for his guidance and wise counsel. Additionally, we are tremendously grateful for continued support from FAS Dean Claudine Gay, FAS Dean of Science Christopher Stubbs, FAS Dean of Social Sciences Lawrence Bobo, Harvard College Dean Rakesh Khurana, Provost Alan Garber, Vice Provost for Research Richard McCullough, HMS Dean George Daley, Harvard Catalyst, the Office of the President, Harvard SEAS and Harvard College.

We are incredibly excited and proud to present our newest issue and to share this outstanding research with the Harvard community. Enjoy!

Sincerely,



Michael Gao
Co-Editor-in-Chief



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About Us

The Harvard Undergraduate Research Journal (THURJ) showcases peer-reviewed undergraduate student research from all academic disciplines. As a biannual publication, THURJ familiarizes students with the process of manuscript submission and evaluation. Moreover, it provides a comprehensive forum for discourse on the cutting-edge research that impacts our world today.

At its core, THURJ allows students to gain insight into the peer review process, which is central to modern scientific inquiry. All THURJ manuscripts are rigorously reviewed by the Peer Review Board (consisting of Harvard undergraduates), and the top manuscripts that they select are further reviewed by Harvard graduate students, post-doctoral fellows, and professors. This process not only stimulates faculty-student collaboration and provides students with valuable feedback on their research, but also promotes collaboration between the College and Harvard's many graduate and professional schools. In addition to publishing original student research papers, THURJ is also an important medium for keeping the Harvard community updated on research-related news and developments.

About the Cover

This Cover image shows a student graduating with a sunrise ahead of them. It represents our Best Manuscript for Spring 2019, "The Doubly-Disadvantaged: International First-Generation Students at Harvard". Author Pablo Zamorano Díaz wrote a paper about the unique experiences and needs of international students who also happen to be the first ones in their families to attend college. Through a series of interviews he pulls together issues of finances, language barriers, and social class.

Image sources: pixabay.com

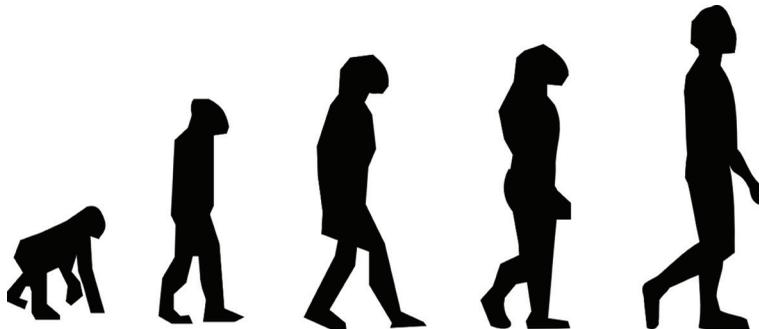


— 11

Felony Disenfranchisement as Backlash: Florida's History of African American Voting Rights

by Evan MacKay '19

Around 5 million people in the United States are unable to register to vote due to a prior felony record. Felony disenfranchisement has been used to cull the electorate since its introduction, though initially it was a narrow policy mostly related to anti-corruption and fraud. Since then, it was expanded to counter gains in voting eligibility to low income. Its reach grew through the criminalization of African Americans following the Civil War. Since the passage of the Voting Rights Act in 1965, felony disenfranchisement ballooned alongside mass incarceration to become the principle barrier to voting eligibility in the United States. The recent expansion of voting eligibility in Florida confronts a history of injustice, particularly against African Americans. At the same time, Amendment 4 is incomplete in its continued exclusion of people who were convicted of murder or sex crimes, those who are unable to pay fines and fees, and those who are currently incarcerated, on parole, or on probation.



The Neanderthal Genome and Its Importance for Understanding Human Evolution

by Madeleine Kelly '20

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In this paper, I review the research that has been done on Neanderthal DNA, and I explore the ways in which Neanderthal DNA can be used to understand aspects of human evolution. The main question driving this paper is whether or not we can use DNA to explain why the Neanderthals went extinct while modern humans survived. I give some background on the history of Neanderthal DNA studies and outline the major published Neanderthal genomes. I then discuss studies that have used the published genomes to make inferences about interbreeding between Neanderthals and modern humans, and how natural selection may have acted on Neanderthal DNA in modern humans. Finally, I discuss the potential implications that the genes that modern humans inherited from Neanderthals might have in today's populations, and explore possibilities for future research based on the information that has been reviewed in the paper. My main conclusion is that there is still much research to be done involving the effects of Neanderthal DNA on modern humans today, but with more data and better technology, it might be possible to determine the traits that made us so successful, while Neanderthals went extinct.

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The Doubly-Disadvantaged: International First-Generation Students at Harvard

by Pablo Zamorano Díaz '20

This research enlightens the unique experiences and needs of international students who also happen to fit within the category of being the first ones in their families attending college. In a series of interviews conducted at Harvard University, the sense of belonging of this particular group of students proved to be the most salient challenge when moving to a four-year university in the United States. Even when trying to connect with students from their same country, social class for these first-generation students plays a role that prevents them from finding a place they feel they belong. This could be ameliorated by providing a social class-diverse organization on campus that systematically supports these students throughout their time at Harvard, not only as an orientation program. Academic adjustment to how the college system works is also a challenge that can be worked out by establishing one-on-one mentorship with authority figures of the university, such as faculty who are first-generation college graduates or by faculty who have been trained on how to better correspond with this specific population.



Bint al-Nil, Daughters of the Nile: Tensions and Reconciliations within the Egyptian Feminist Movement in 1950's Egypt

by Asma Elgamal '19

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—

This paper explores the relationship between Egyptian nationalism and feminist activism in 1950's Egypt through the lens of Bint al-Nil, the eponymous journal of the women's union "Bint al-Nil." To do so, I first provide an overview on Doria Shafik, founder of Bint al-Nil (the union and the journal), and an overview of the complicated relationship between nationalism and feminism in Egypt during the 1940s and 50s. Building on this context, I then point out several areas of tension between the actions of Shafik's feminist movement and its stated goals. To augment this, I translated four primary source documents from Arabic into English; all four documents are letters penned by Shafik and published in the Bint al-Nil journal. These letters underscore the tensions brought up in the paper while shedding light on Shafik's personal relationship with nationalism and feminism in a fascinating way. The documents were found on the public online archives at the American University of Cairo and, to the best of my knowledge, have never been translated before. My ultimate goal for this paper is to commend Shafik for her efforts within the Egyptian Feminist Movement while also offering a candid look into some of her inconsistencies.



Research

Felony Disenfranchisement as Backlash: Florida's History of African American Voting Rights

Evan MacKay
Harvard College '19

Around five million people in the United States are unable to register to vote due to a prior felony record. Felony disenfranchisement has been used to cull the electorate since its introduction, though initially, it was a narrow policy mostly related to anti-corruption and fraud. Since then, it was expanded to counter gains in voting eligibility to low income. Its reach grew through the criminalization of African Americans following the Civil War. Since the passage of the Voting Rights Act in 1965, felony disenfranchisement ballooned alongside mass incarceration to become the principal barrier to voting eligibility in the United States. The recent expansion of voting eligibility in Florida confronts a history of injustice, particularly against African Americans. At the same time, Amendment 4 is incomplete in its continued exclusion of people who were convicted of murder or sex crimes, those who are unable to pay fines and fees, and those who are currently incarcerated, on parole, or on probation.

Introduction

In 1959, 23-year-old Wallace McDonald fell asleep on a bench waiting for a bus to come — he awoke to being arrested for vagrancy.¹ Forty-one years later, this incident prevented him from voting in Florida during the contentious 2000 presidential election.² Wallace is a victim of felony disenfranchisement, the legal exclusion of people with prior felony records from voting or registering to vote. Florida had been the strictest state in the nation with voting eligibility for people with criminal histories; however, this is currently changing due to a citizen ballot initiative, Amendment 4, which passed with 65% support in the 2018 election.³ Amendment 4, which will enable Wallace and other people with prior criminal histories to vote after finishing their sentences, is only the most recent chapter in felony disenfranchisement's history as a tool to cull the electorate of undesirable voters and to disempower African Americans.

Disenfranchisement due to prior criminal history has grown dramatically as strict policies on voting eligibility for returning citizens⁴ combine with mass incarceration and the War on Drugs that have both increased the number of people with felony records. As of 2016, approximately 6.1 million people in the United States

cannot vote because of a prior felony conviction — up from 1.17 million in 1976, 3.34 million in 1996, and 5.85 million in 2010.⁵ Although felony disenfranchisement has indirect effects beyond politics, the impact on the political landscape is dramatic: according to legal scholar Pamela Karlan, “Felony disenfranchisement has decimated the potential black electorate.”⁶ Although policies have changed over time, today a majority of states disenfranchise people in prison, on parole, and on probation, and a minority disenfranchise people after their sentences are over, usually for life.

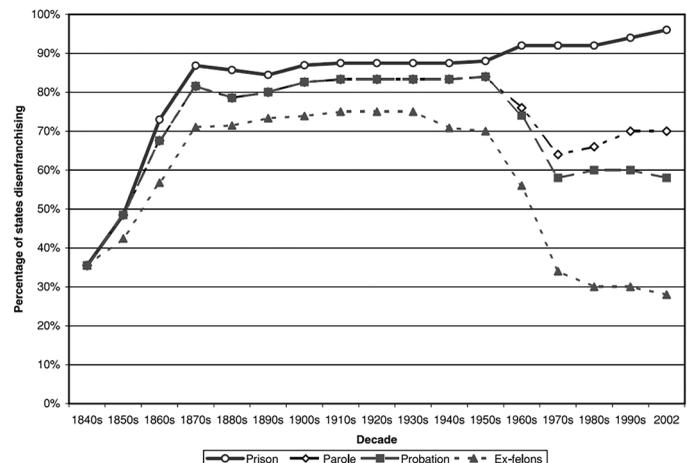


Figure 1: Changes in State Disenfranchisement Law by Class of Felons Disenfranchised⁷

As of 2016, around 22% of disenfranchised people are in prison, 8% are on parole, 28% are on probation, and the majority, 51%, are disenfranchised post-sentence.⁸ Florida's strict lifetime disen-

1. Ari Berman, *Give Us the Ballot: The Modern Struggle for Voting Rights in America*. New York: Picador/Farrar, Straus and Giroux, 2016: 208.
 2. Felony disenfranchisement likely was decisive in the victory of George W Bush for President of the United States, impossible without Florida's 25 electoral college votes. In 2000, when certifying votes of the electoral college, members of the Congressional Black Caucus walked out in protest due to violations of the Voting Rights Act of 1965 and the racially discriminatory impact of felony disenfranchisement. Other analyses have pointed to seven elections to the US Senate that likely would have produced different results absent felony disenfranchisement; see Christopher Uggen and Jeff Manza, “Democratic Contraction? Political Consequences of Felon Disenfranchisement in the United States.” *American Sociological Review* 67, no. 6 (December 2002), 777. <https://doi.org/10.2307/3088970>. (15 Dec 18) and Berman, 212-213.
 3. “Florida Amendment 4, Voting Rights Restoration for Felons Initiative (2018),” Ballotpedia, n.d., [https://ballotpedia.org/Florida_Amendment_4_Voting_Rights_Restoration_for_Felons_Initiative_\(2018\)](https://ballotpedia.org/Florida_Amendment_4_Voting_Rights_Restoration_for_Felons_Initiative_(2018)). (15 Dec 18)
 4. The term “returning citizens” means people who are exiting criminal justice involvement, such as people exiting prison. Synonyms include ex-con, ex-felon, or post-incarcerated person. This draws on guidance from the Language Letter Campaign to center humanizing language for people who have been directly impacted by the prison system. See Eddie Ellis, “An Open Letter to Our Friends on the Question of Language,” *Center for NuLeadership on Urban Solutions*, n.d. <https://cmjcenter.org/wp-content/uploads/2017/07/CNUS-AppropriateLanguage.pdf> (15 Dec 18).

5. Christopher Uggen, Ryan Larson, and Sarah Shannon, *6 Million Lost Voters: State-Level Estimates of Felony Disenfranchisement*, 2016, The Sentencing Project, 2016, 3.
 6. Michelle Alexander, *The New Jim Crow: Mass Incarceration in the Age of Colorblindness*. (Prince Frederick, MD: Recorded Books, 2012), 193.
 7. States vary between extremes of no disenfranchisement at all to lifetime disenfranchisement for all people with felony records; see Jeff Manza and Christopher Uggen, “Punishment and Democracy: Disenfranchisement of Nonincarcerated Felons in the United States,” *Perspectives on Politics* 2, no. 03 (September 2004), 493.
 8. “Post-sentence” refers to disenfranchisement occurring after incarceration, parole, and probation; see Christopher Uggen, Ryan Larsen, and Sarah Shannon. “6 Million Lost Voters: State-Level Estimates of Felony Disenfranchisement,

franchisement policy and the high rate at which it criminalizes its residents have resulted in the disenfranchisement of over 1.6 million Floridians; that is to say, more than 1 in 4 people in the United States who are disenfranchised are disenfranchised by Florida.

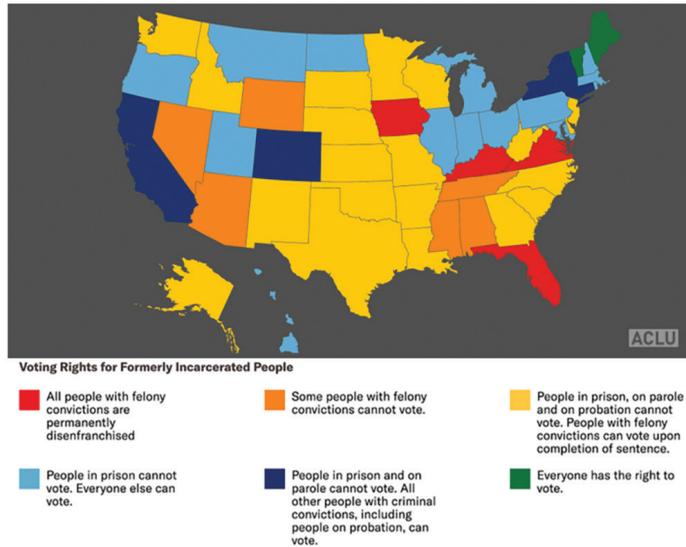


Figure 2: Disenfranchisement by State 2019⁹

The 15th Amendment and the Voting Rights Act of 1965 (VRA)¹⁰ each advanced African American suffrage significantly, and these two historic moments mark inflection points that delineate three periods in the history of American felony disenfranchisement. Moreover, voting eligibility within the United States has been racialized since the country's founding. Therefore, it is with an awareness of race that history should frame the practice of felony disenfranchisement. Prior to the 15th Amendment, felony disenfranchisement functioned primarily to codify an understanding that people convicted of crimes were ineligible to vote. During this first period, people of color could not vote, which is to say that felony disenfranchisement at the time did not stem from anti-Black sentiment. After the 15th Amendment, many states — especially those formerly within the Confederate States of America, like Florida — enacted a network of laws to prevent African Americans from voting. Felony disenfranchisement was one of these policies that, combined with the Black Codes criminalizing many African Americans, made African American suffrage precarious even in light of the 15th Amendment. After the VRA eliminated many of the other barriers to African American suffrage, felony disenfranchisement rose in prominence alongside mass incarceration to become the principal legal restriction to the voting eligibility of African Americans. Even as many states expanded voting eligibility post-sentence, the number of people disenfranchised still grew due to the sheer quantity of people impacted by incarceration and community supervision. Florida offers an especially insightful case study of a state moving through these three time periods, and examining Florida as such exposes the role of felony disenfranchisement in resisting the advances in African American voting rights.¹¹ Moreover, the

2016.” 2016.

9. “Felony Disenfranchisement Laws (Map).” American Civil Liberties Union. Accessed April 14, 2019. <https://www.aclu.org/issues/voting-rights/voter-restoration/felony-disenfranchisement-laws-map>.

10. Throughout this paper, VRA refers to the Voting Rights Act of 1965; its later reauthorizations are not examined for their impacts on felony disenfranchisement in this paper.

11. This essay uses the terms “eligibility to vote,” “right to vote,” and “voting

passing of Amendment 4 in Florida exhibits the state's late arrival to the most recent chapter in the history of American felony disenfranchisement, ending voting restrictions for ex-felons.

Before 1865 and the Reconstruction Amendments

Although Florida became a state in 1845 only a short time before the Civil War and Reconstruction, the state's criminal disenfranchisement during that period led the nation. Indeed, Florida's inclusion of felony disenfranchisement in its 1838 Constitution prompted a wave of other new states doing the same. This disenfranchisement clause responded specifically to newly relaxed property and taxpaying requirements that had expanded suffrage to low-income white men.

Prior to Florida's statehood, criminal disenfranchisement had an extensive history within the United States. Mostly, disenfranchisement removed people with certain criminal histories from the already narrow population of wealthy white men eligible to vote. Drawing from a tradition of social exclusion that followed people who committed crimes in Europe, settlers of early American colonies likewise excluded people with criminal histories from participating in town forums, where votes took place.¹² At the time, criminal disenfranchisement was more of a common cultural practice than it was something legal; in these fledgling communities, people would know who had a criminal history and would thus exclude them. Some legal exclusion did exist, however, such as a colonial statute in Connecticut that prohibited people who committed scandalous offenses such as public drunkenness from voting “until the court shall manifest their satisfaction.”¹³ When drafting the United States Constitution, some members such as Benjamin Franklin and Ethan Allen hoped to establish expansive suffrage and to protect voting as a right of citizenship — even a “natural right,” like life and liberty.¹⁴ Others wished to curtail voting significantly.¹⁵ Ultimately, the Constitution left voting eligibility up to the states' jurisdiction as a compromise between the two factions. For this reason, voting eligibility today varies so dramatically from state to state that political theorist Katherine Pettus suggests it is better to think about political citizenship as pertaining to fifty-one separate republics, each of which defining what is “criminal” and

rights” interchangeably. The scope of this paper does not warrant a discussion of whether voting is a right or a privilege.

12. The practice of excluding people with prior criminal histories from society, including disenfranchisement, extends back to ancient Greece and the Roman empire. Referred to as “*atimia*” in Greece and “*infamia*” by the Romans, these practices prevented people with certain narrowly defined criminal histories from exercising their ability to vote. At the time, this pertained to only a very few number of people due to the already low rate of voting eligibility in these societies. Medieval Europe had a version of this practice referred to as, “civil death.” See Jeff Manza and Christopher Uggen, *Locked out: Felon Disenfranchisement and American Democracy*, (Oxford; New York: Oxford University Press, 2006), 22. Today, lifetime disenfranchisement has been discussed as the “voting death penalty,” drawing from this earlier history. See Michael F. Higginbotham, *Ghosts of Jim Crow: Ending Racism in Post-Racial America*. New York: New York University Press, 2013: 190.

13. Manza and Uggen, *Locked Out*, 24. Other punishments were for life, unlike this statute. For example, women who had “fallen” experienced lifetime social exclusion and stigmatization; see Michelle Jones and Lori Record. “Magdalen Laundries: The First Prisons for Women in the United States.” *Journal of the Indiana Academy of the Social Sciences* 17, no. 1 (2017): 169.

14. *Ibid.*, 20.

15. There are a variety of reasons people disagree on the topic of felony disenfranchisement. One idea is that elections work best if they include everybody. Another idea is that they would work better with a select subset of elite people deemed capable and responsible enough to vote wisely. This belief might also posit that people with felony records are not trustworthy as voters. Sometimes ideas on felony disenfranchisement are related to democracy and voting. Other opinions on the issue characterize it in terms of the criminal legal system, e.g. considering whether it is fair to victims of crime.

determining the right to vote of people labeled as such.¹⁶ No state, though, legally enacted felony disenfranchisement until Kentucky in 1792.¹⁷

Florida was one of the first states to simultaneously grant universal white male suffrage and restrict “undesirables” from voting with felony disenfranchisement, opening the legal backdoor to voting rights restrictions through felony disenfranchisement for the first time. When states like Florida granted expansive suffrage to all white men, they also gave themselves alternative methods to keep certain people from voting. Drafting exclusions similar to those that would later appear in other state constitutions, Florida ratified its first state constitution in 1838 with the following clause:

The General Assembly shall have power to exclude from every office of honor, trust or profit, within the State, and from the right of suffrage, all persons convicted of bribery, perjury, or other infamous crime.

This section addresses crimes related to election fraud by barring those who have committed them, first, from holding office and, second, from voting. In its syntax, it reads as though suffrage is an afterthought. More interestingly, this voting prohibition does not appear in the same section that outlines voting eligibility, Section 1 of the same article. In that section, the document reserves the right to vote for “Every free white male person of the age of twenty-one years and upwards.”¹⁸ This indicates that Florida’s voting policies did not directly consider criminal history as fundamental in determining eligibility; rather, felony disenfranchisement was principally related to crimes that interfered with elections and governance. Moreover, the criminal justice system was only beginning to take shape in the manner of today, minimizing the number of “felons” that states could disenfranchise simply due to a lack of the legal infrastructure.¹⁹

Before the Civil War, felony disenfranchisement was not racialized as it would be in later years, but it was still used as a backlash to voting by undesirable people, i.e. white people from lower classes. Before the Reconstruction Amendments, African Americans and other people of color were almost universally disenfranchised in the US. At the dawn of the Civil War, only six states, all with small African American populations, permitted African Americans to vote. Still, even these states had restrictive policies that effectively disenfranchised many African Americans, like New York’s substantial \$300 property requirement applicable only to African Americans.²⁰

Felony disenfranchisement impacted few Floridians during this time period; still, Florida’s felony disenfranchisement was a response to expanded voting rights, and this set a precedent nationwide. As states abolished taxpaying and property requirements, felony

disenfranchisement policies increased.²¹ Between 1840 and 1865, each of the sixteen states that enacted new felony disenfranchisement practices did so after eliminating property tests for voting eligibility, like Florida.²² Thus, even in this early history, states used felony disenfranchisement as a backlash against expansions in voting eligibility. New states established during this period included felony disenfranchisement from their ratification: seventeen of the nineteen states established after 1850 included felony disenfranchisement practices.²³

Backlash to the Reconstruction Amendments (1865 - 1965)²⁴

Felony disenfranchisement changed dramatically after the Civil War and the Reconstruction Era. In response to an expansion of the franchise to former slaves and other African Americans through the 15th Amendment, states passed a variety of legislation and constitutional measures to prevent African Americans from voting such as the Black Codes and other practices that effectively criminalized blackness. These policies of criminalization and disenfranchisement stemmed from white perceptions of racial threat.²⁵ To quell this fear, antagonistic state governments reacted punitively to advances in voting eligibility for African Americans with increased felony disenfranchisement, as they did before to expanded suffrage for low-income white people. Moreover, the size and scope of law enforcement and the legal system, especially in their interactions with African Americans, grew dramatically after the abolition of slavery which resulted in more “felons,” and therefore more felony disenfranchisement.

Florida disenfranchised large groups of former felons after the US Congress rejected its first Reconstruction Constitution because it limited suffrage to only white male citizens. Like the Florida Constitution of 1838, Florida’s first constitution ratified after the Civil War in 1865 permitted voting to “Every free white male person of the age of twenty-one years and upwards.”²⁶ Article VI Section 2 stated the following:

The General Assembly shall have power to exclude from every office of honor, trust, or profit within the State, and from the right of suffrage, all persons convicted of bribery, perjury or other infamous crime.

This is the same eligibility as described in the Florida Constitution of 1838; when Florida leaders were granting suffrage to only white men, they advocated for no additional expansion of disenfranchisement. However, Florida leaders were forced to draft a new state constitution after their Congressional delegation was not seated. In this new Florida Constitution, ratified in 1868, the right of suffrage belonged to “Every male person of the age of twenty-one

16. Katherine Irene Pettus, “Felony Disenfranchisement in America: Historical Origins, Institutional Racism, and Modern Consequences,” *Criminal Justice*, New York: LFB Scholarly Publishing LLC, 2005: 61.

17. Alexander Keyssar, *The Right to Vote: The Contested History of Democracy in the United States*, (New York: Basic Books, 2000), 324.

18. Florida, State Library and Archives of. “Constitution of 1838.” *Florida Memory*. Accessed December 5, 2018. <https://www.floridamemory.com/items/show/189087?id=7>. (15 Dec 18)

19. For example, New York City and Philadelphia did not have regular police officers until 1845; see Manza and Uggen, *Locked Out*, 54.

20. This was coupled with racist rhetoric, such as Colonel Samuel Young claiming that “The minds of blacks are not competent to vote”; see Manza and Uggen, *Locked Out*, 42; Erika Wood. “Jim Crow Haunts N.Y. Blacks.” Brennan Center for Justice, March 12, 2010. <https://www.brennancenter.org/analysis/jim-crow-haunts-ny-blacks>

21. Keyssar, 50.

22. Manza and Uggen, *Locked Out*, 54.

23. *Ibid.*, 54.

24. Although the major advancement was the 15th Amendment ratified in 1870, the beginning of this period of legal antagonism in the face of a now inevitable African American electorate began around 1865 with the Civil War.

25. Angela Behrens, Christopher Uggen, and Jeff Manza, “Ballot Manipulation and the ‘Menace of Negro Domination’: Racial Threat and Felon Disenfranchisement in the United States, 1850–2002.” *American Journal of Sociology* 109, no. 3 (November 2003), 559–605.

26. Florida, State Library and Archives of. “Constitution of 1865.” *Florida Memory*. Accessed December 5, 2018. <https://www.floridamemory.com/items/show/189093?id=24>. (15 Dec 18)

years and upwards, of whatever race, color, nationality, or previous condition.”²⁷ At the same time that Florida granted voting rights to African Americans, it expanded disenfranchisement:

No person under guardianship noa compos mentis, or insane, shall be qualified to vote at any election, nor shall any person convicted of felony be qualified to vote at any election unless restored to civil rights.²⁸

When the US Congress forced Florida to enfranchise African Americans, the state concurrently implemented a dramatic expansion of exclusions to voting based on criminal history. The exchange of Florida’s methodologies to disenfranchise African Americans can be understood through the maintenance of white privilege described by legal scholar Reva Siegel as “preservation through transformation.”²⁹ In this particular case, Ari Berman writes the following:

In 1868, to prevent newly emancipated African-Americans from exercising the franchise, Florida passed a law banning anyone with a criminal conviction from voting unless the governor pardoned [them].³⁰

In this chronology, felony disenfranchisement crystallizes as a backlash to the expansion of voting eligibility for African Americans that the 15th Amendment and the US Congress demanded.

In fact, Florida’s response to African Americans’ voting depicts Stanley Cohen’s and Stuart Hall’s concept of a “moral panic.”³¹ The topic of African American voters was sensationalized in the South through leaders and newspapers as a threat to the Southern way of life. The Yazoo City Banner wrote, “Mississippi is a white man’s country, and by the Eternal God we’ll rule it.”³² People previously in power in Florida prior to the Civil War — white propertied owners and other white people benefitting from a racial hierarchy — were afraid of the prospects of an African American electorate. In response, Florida legally challenged the ability of African Americans to vote via felony disenfranchisement policies, the Black Codes, and a host of other disenfranchising policies. These formal disenfranchisement policies accompanied racial terrorism outside of the law, another indication of the white moral panic.

Prior to the end of slavery in much of the American South³³ including Florida, the formal legal system primarily responded to crimes committed by white perpetrators, while white slave owners punished African American perpetrators.³⁴ After the abolition of slavery, however, the legal system began to target African Americans in the South: for example, African Americans made up 2% of the Alabama prison population in 1850 but 74% by 1870.³⁵ As the

system of incarceration and labeling people as “felons” grew, so did the scope of felony disenfranchisement.

The convict leasing system also increased the number of people labeled as “felons” and thus disenfranchised. The Florida economy and sociopolitical landscape were founded on the provision of free, coerced labor, like those in the rest of the South.³⁶ Losing the Civil War did not change the demand for this labor. Thus, even under military control and during Reconstruction, propertied interests of power within the South adapted to the new legal reality of the abolition of slavery by finding a new source of cheap, coerced labor: convicts.³⁷ The need for labor to build Southern infrastructure, work the old plantations, and mine coal spurred the rapid expansion of a legal system that ensnared former slaves and other African Americans.³⁸ Florida was no exception. There, it was even possible for business owners to request the arrest of certain African American men if they looked especially capable of exhausting physical labor.³⁹ Law enforcement would find the man, arrest him for one arbitrary reason or another, and leave him helpless to the legal system and its devices. Finally, the state would lease him to the private property owner.⁴⁰ In fact, Florida had no state prison but rather operated entirely on a system of profitable convict labor.⁴¹ Even the state government depended on this forced labor and thus had labor incentives to criminalize African Americans.⁴² This system of convict leasing underscores the subjective nature of “criminality” and explains the large number of African Americans who quickly became justice involved. For example, in advance of a lucrative convict leasing deal with the Putnam Lumber Company, a “crime wave” hit Leon County, Florida, and vagrancy arrests rose 800% in the seven months before the deal to meet the labor demand of the company.⁴³ Florida was the penultimate state to end convict leasing of state prisoners in 1919,⁴⁴ and the closely related system of “road prisons” extended into the 1960s with legacies remaining today: “The history of penal reform repeatedly demonstrates that even as things change, the past survives, problems repeat themselves and institutions are rarely transformed wholesale.”⁴⁵ The convict leasing system and the later systems of bondage are emblematic of the arbitrary nature of “criminality” and disenfranchisement itself.

States determined which actions were criminal and additionally what happened to the voting eligibility of those who performed these actions,⁴⁶ choosing to aggressively enact new methods to criminalize blackness and to restrict voting access for people convicted of

27. Florida, State Library and Archives of. “Constitution of 1868.” *Florida Memory*. Accessed December 5, 2018. <https://www.floridamemory.com/items/show/189095?id=22>. (15 Dec 18)

28. *Ibid.*

29. Alexander, 21.

30. Berman, 209.

31. Stuart Hall, *Policing the Crisis: Mugging and Law N Order*, Birmingham: University of Birmingham, 1976: 16.

32. Oshinsky, 39.

33. Throughout this paper, “The South” is characterized by being a slave state. Nearly all of the slave states are also influenced by their membership in the Confederate States of America. Border states, Delaware, Maryland, Missouri, Kentucky, and West Virginia, though not part of the CSA, are still considered the South because slavery in these states persisted into the Civil War.

34. David M. Oshinsky, “Worse than Slavery”: *Parchman Farm and the Ordeal of Jim Crow Justice*. 1. ed. (New York: Free Press, 1997), 32.

35. Manza and Uggen, *Locked Out*, 57

36. Larry Rivers, “Slavery and the Political Economy of Gadsden County, Florida: 1823-1861.” *The Florida Historical Quarterly* 70, no. 1 (July 1991), 1-19 and David Oshinsky, “Worse Than Slavery,” 56-57.

37. Oshinsky, 40.

38. Douglas A. Blackmon, *Slavery by Another Name: The Re-Enslavement of Black People in America from the Civil War to World War II*, New York: Doubleday, 2008: 308.

39. Oshinsky, 71.

40. This work in Florida primarily used men as laborers, but women were also used in forced labor, such as in the Magdalene laundries; see Michelle Jones and Lori Record, “Magdalene Laundries: The First Prisons for Women in the United States.” *Journal of the Indiana Academy of the Social Sciences* 17, no. 1 (2017): 171.

41. Oshinsky, 70.

42. *Ibid.*, 62.

43. *Ibid.*, 74. The demand for convicts was also driven by the very high mortality rate due to dangerous conditions and medical neglect; see Oshinsky, 55-56, 84.

44. In response to the end of convict leasing of state prisoners, law enforcement officials in Florida simply increased the number of county convicts, again affirming the adage that “the more things change, the more they stay the same.” Leasing of county convicts did not end until 1923 after an economic boycott of Florida products following the well publicized death of a white twenty-two-year-old, Martin Tabert, in a convict leasing camp; see Oshinsky, 74-75.

45. Heather Schoenfeld, “The Delayed Emergence of Penal Modernism in Florida.” *Punishment & Society* 16, no. 3 (July 2014), 258-84.

46. Pettus, 61.

crimes. Examples include the criminalization of vague actions such as vagrancy targeted against African Americans, juries that silenced African American defendants, racist actors in law enforcement and the judicial system, and the myriad other structural disadvantages former slaves faced. States such as Alabama and Mississippi were especially sophisticated in targeting African Americans by disenfranchising people with a criminal record for smaller crimes like petty theft, which were stereotypically associated with African Americans, while not disenfranchising people convicted of rape or murder, which “had not originally been believed to be ‘black’ crimes”.⁴⁷ When states criminalized blackness like this, the inconsistent nature of the law made justice for African Americans in the legal system as impossible as voting.

In contrast to previous felony disenfranchisement practices, these policies adopted after the Civil War and into the first half of the 20th century were designed to limit African American political power, demonstrating the planned nature of these policies’ racial effects. Many advocates of felony disenfranchisement, especially those from the South, made little effort to disguise this process as something other than a legal backdoor to protect white supremacy at the voting booth. At the 1902 Virginia constitutional convention, future US Senator Carter Glass declared the following:

This plan will eliminate the darkie as a political factor in this State in less than 5 years, so that in no single county...will there be the least concern felt for the complete supremacy of the white race in the affairs of government.⁴⁸

The disproportionate disenfranchisement of African Americans is not an unintended consequence of this policy, nor an unfortunate byproduct of high arrest rates, nor an indictment of “poor choices” or character flaws among communities of color: this political weakening of the African American community was deliberate and effective into the present day.

At the same time that white legislators advocated for felony disenfranchisement due to its ability to suppress the African Americans vote, criminal disenfranchisement was only a small portion of the widespread legal voter suppression that targeted African Americans, especially in the South. During the backlash to Reconstruction, Florida and other states implemented grandfather clauses, literacy tests, all-white primaries, and many other procedures of disenfranchisement. Florida led many of these policies, such as through its 1889 adoption of the poll tax before it spread to nearby states.⁴⁹

Arguably, though, these different forms of legal disenfranchisement, even combined, were still likely not the largest obstacle to voting — the Ku Klux Klan (KKK) and other terrorist white supremacist organizations presented the greatest threat.⁵⁰ For many African Americans, the risk of registering to vote, let alone voting itself, was not one they could take. Legal disenfranchisement and extralegal race-based terrorism were not mutually exclusive, however; many of the legislators, law enforcement, and prosecutors who created legal disenfranchisement also supported or participated

in that terrorism.⁵¹ This was particularly true in Florida. It was St Augustine, Florida, after all, where Martin Luther King Jr. decided to “expose combined Klan and constabulary hatred.”⁵² During this time period after the Civil War and Reconstruction, then, felony disenfranchisement was not the foremost barrier to voting. Rather, it was one of many legal barriers alongside the extra-legal efforts of white supremacist terrorist organizations, and it remained that way until the mid-twentieth century.

Felony Disenfranchisement Since 1965

The third period of felony disenfranchisement began after the passage of the Voting Rights Act in 1965 when felony disenfranchisement coupled with mass incarceration to weaken the African American electorate. Felony disenfranchisement thereafter became the primary legal barrier to African Americans exercising the franchise. In this way, the seeds of the backlash to the Voting Rights Act had been planted, and mass incarceration and the increasing population of “felons” allowed this backlash to flower. Since 1965, states have both expanded and contracted voting access for returning citizens, and there is not a clear narrative of progress.

Perhaps the greatest achievement in the enduring fight for African American suffrage is the Voting Rights Act of 1965. For many African Americans, the Voting Rights Act of 1965 secured the right to vote that they had never truly had. Between 1964 and 1969 rates of voter registration skyrocketed, especially among African American communities in the South; for example, in neighboring Alabama the percentage of registered African American adults rose from 19.3 to 61.3.⁵³ The VRA and subsequent actions like the 24th Amendment abolished major pieces of legal disenfranchisement, such as literacy tests and poll taxes, and required jurisdictions with histories of racial animus to gain preclearance for changes to their voting procedures and eligibility. The VRA, however, did not discuss felony disenfranchisement, which remained in practice as part of a compromise because it had not been the principal barrier to voting by African Americans up until that point and was not a focal point of the Civil Rights Movement given other more pressing concerns.

After the Voting Rights Act’s passage, the number of people who were unable to vote because of their criminal history grew dramatically, contradicting the simplistic narrative of expanded voting rights during this time. Many states revisited their disenfranchisement policies, expanding the crimes that merited the penalty, again aligning with the pattern of felony disenfranchisement as a backlash to expansions in voting eligibility. For example, in Mississippi, people who had histories of murder and other serious crimes lost the right to vote, whereas before disenfranchisement only applied to a narrower list of crimes leveraged against African Americans.⁵⁴ However, the main reason the number of disenfranchised people spiked was the rise of mass incarceration, particularly through the War on Drugs and the actions of courts and law enforcement against communities of color.⁵⁵ Felony disenfranchisement is a byproduct

51. Sometimes law enforcement and KKK members worked together to confront African Americans and racial justice advocates, such as when they raided and wrecked offices of the International Labor Defense committee, a pro-union legal advocacy group; see Wyn Craig Wade, *The Fiery Cross: The Ku Klux Klan in America*, New York: Simon and Schuster, 1987: 260.

52. *Ibid.*, 329.

53. Alexander, 38.

54. Manza and Uggen, *Locked Out*, 42.

55. The rise of plea bargaining and prosecutorial discretion should also be examined for their role in the expansion of disenfranchisement. Many people do not know they are losing the ability to vote or serve on a jury when they plead guilty;

47. Keyssar, 250.

48. Carol Anderson, *One Person, No Vote: How Voter Suppression Is Destroying Our Democracy*, New York, NY: Bloomsbury Publishing, 2018: 3.

49. Williams, Frank B. “The Poll Tax as a Suffrage Requirement in the South, 1870-1901.” *The Journal of Southern History* 18, no. 4 (1952): 469-96. <https://doi.org/10.2307/2955220>.

50. Anti-black election fraud compounded this; see Oshinsky, 38-39.

of the criminal justice system, meaning the communities that the criminal justice system targets are the same communities felony disenfranchisement affects. With the rise of mass incarceration, an enormous amount of people came in contact with the legal system and thus were subject to felony disenfranchisement. No longer did criminal disenfranchisement only surround issues of perjury or fraud.

While there has not been a major reform since the Civil Rights Era, more states have expanded eligibility in this third period than during the previous two, especially post-sentence eligibility. Although most of the Civil Rights Movement's attention focused on other policies restricting the African American vote — many of which the Voting Rights Act addressed — felony disenfranchisement did receive some attention.⁵⁶ Part of the movement against felony disenfranchisement continued after the Civil Rights Era ended, with many states ending lifetime disenfranchisement between the 1960s and 1980s before the “tough on crime” wave peaked.⁵⁷ However, most civil rights leaders considered ending felony disenfranchisement with less urgency than it receives now, perhaps because incarceration rates and rates of people disenfranchised were smaller and because there was not as widespread an understanding of the criminal legal system's racial underpinnings.

Legal challenges to felony disenfranchisement had a history of failure such as in 1898 with *Williams v. Mississippi*,⁵⁸ but many cases challenged disenfranchisement until the Supreme Court's 1974 ruling in *Richardson v. Ramirez* put a stop to most of them.⁵⁹ *Richardson v. Ramirez* sanctioned felony disenfranchisement because it denied the vote to individuals who participated in crime, as permitted in the 14th Amendment. Justice Thurgood Marshall wrote a strong dissent arguing that the 15th Amendment effectively repealed this portion of the 14th Amendment. Other similar critics hold up the *Richardson v. Ramirez* majority opinion as a failure of a strictly textualist approach to the Constitution and its Amendments.⁶⁰ *Richardson v. Ramirez* established the current status of felony disenfranchisement in the law, and advocates turned to other avenues like legislative bodies for re-enfranchisement.

During this most recent period, efforts to reform have often centered the racial implications of the criminal legal system and mass incarceration, like in Virginia.⁶¹ Then Governor Terry McAuliffe underwent a multi-year court battle to re-enfranchise over 168,000

see Alexander, 142.

56. Felony disenfranchisement and voting access for people who are justice involved were discussed within the prisoners rights movement of the 1960s.

57. Keyssar, 247.

58. Although disenfranchisement primarily excluded African American voters, the Supreme Court held that these did not “on their face discriminate between the races, and it has not been shown that their actual administration was evil, only that evil was possible under them.” Effectively, the Supreme Court held that disenfranchisement was permissible because people could choose to follow the law, ignoring racial discrimination within the legal system. See Higginbotham, 77.

59. *Richardson v. Ramirez* closed the door on equal protections challenges to disenfranchisement in a 6-3 decision by the US Supreme Court drawing on Section 2 of the 14th Amendment. The notable exception is *Hunter v. Underwood* in 1985 which denied disenfranchisement with clear discriminatory intent in Alabama. This ruling, however, did not end disenfranchisement in Alabama, and other states do not have the demonstrated racial animus as clearly as Alabama had. In short, *Richardson v. Ramirez* is a continuation, not a cutpoint, in the history of disenfranchisement; see Keyssar, 249.

60. Manza and Uggen, *Locked Out*, 29-33.

61. Although it received less attention because it is not a swing state and impacted fewer people, Louisiana also passed legislation in early 2018 enabling people with felony records who are on parole or probation for at least five years without being incarcerated to vote. This issue, also put to politicians instead of to voters, emphasized the racial justice implications through networks of activist organizations, like the Advancement Project. See “Pass HB 265 in the Louisiana Senate,” *Advancement Project*, 14 May 2018, <https://advancementproject.org/hb265/>. (15 Dec 18)

returning citizens post-sentence.⁶² Opponents described this as a blatantly political maneuver to create new Democratic African American voters in a swing state. McAuliffe countered, justifying the move with his legal authority as governor to grant clemency unilaterally and focusing on the racially disparate impacts and intent of felony disenfranchisement, citing former Virginia Senator Carter Glass.

Often, though, the partisan political fray overwhelms felony disenfranchisement reform, leaving behind those who are disenfranchised. Many times, Democratic Party activists exploit returning citizens' efforts to gain the right to vote, counting on their future votes in a style of campaigning and voter registration which can seem extractive. On the other hand, Republican Party operatives often work in opposition, hoping to retain political control by disempowering communities of color. These partisan campaigns often neglect the needs of returning citizens themselves, with political parties worried more about their own struggles for power. Governor McAuliffe was term-limited and would not face another election, which might have helped him move beyond this partisanship. Other efforts of re-enfranchisement do not have this same ability, because they are put forth to the electorate directly or enacted by politicians concerned about re-election.

Florida's Amendment 4 campaign — spearheaded by Floridians for a Fair Democracy (FFD) — deliberately underplayed the racialized history and impacts of felony disenfranchisement. Re-enfranchisement in Florida occurred with a constitutional amendment that required 60% of Floridians' support to pass. Focus groups showed that racial justice messaging could turn some people away from Amendment 4: white Florida voters did not want to hear about remaining legacies of the Jim Crow era or “The New Jim Crow.”⁶³ To prevent a racial or partisan narrative from dominating, FFD, led directly by disenfranchised returning citizens themselves, made deliberate choices to increase the chances of reaching the 60% threshold. One of these steps minimized messaging on the racial implications of disenfranchisement, focusing instead on the theme of second chances and even naming the campaign Second Chances Florida.⁶⁴ The Chair of FFD, Desmond Meade, often communicated that a majority of people who Amendment 4 would re-enfranchise would be white. Although many African American voters saw Amendment 4 as a step towards racial justice, many white voters who might have reacted negatively to messaging of racial justice still voted for Amendment 4 to support “second chances.” Even though felony disenfranchisement has historically benefited white voters by disempowering African Americans, Second Chances Florida's messaging centered compassion from faith-based communities like evangelical Christians, sympathy for disenfranchised military veterans, and the advantages of reduced recidivism, ultimately gaining enough support throughout a broad cross-section of diverse Florida voters to exceed the high threshold.⁶⁵

62. Dara Lind, “This will be the first election for thousands of Virginians who thought they'd never be able to vote,” *Vox*, 7 Nov 2017, <https://www.vox.com/policy-and-politics/2017/11/7/16618686/virginia-election-felony-vote-disenfranchisement> (15 Dec 18)

63. Alex Newell Taylor, “Message Training and Phone Bank Orientation,” *Floridians for a Fair Democracy*. <https://zoom.us/recording/play/Y190RdvQQzFM3D5EVgmBPp2njgYsXqrBiiQajabtaCzk4Vo0cRmCYW-CaaxItcM7?continueMode=true> (15 Dec 18)

64. “FFD Communications & Messaging Triangle,” *Floridians for a Fair Democracy*. <https://docs.google.com/document/d/1CTwnPVG-pXnZCj0NdZkLvcPqk-tqlaplyWwMJppWm8/edit>. (15 Dec 18)

65. Re-enfranchisement is associated with desistance from crime. In Florida, people who received their voting rights back were much less likely to recommit a crime, controlling for other confounding factors. An economic analysis found

Florida serves as the most recent example of a state enacting post-sentence felony disenfranchisement reform. Florida's policies remained largely unchanged in the second half of the twentieth century; however, due to the rise of mass incarceration and the racist legal system targeting African Americans in the state, the rate of disenfranchisement grew dramatically. In 2005, Republican governor Charlie Crist implemented a clemency procedure that allowed non-violent offenders to gain voting eligibility after completing their sentence; this procedure resulted in 155,000 people regaining their voting eligibility.⁶⁶ The next governor, Rick Scott, also a Republican, reversed this policy. As more people received felony convictions and fewer than 3,000 people regained voting eligibility under Scott, the number of disenfranchised people grew dramatically to over 1.6 million.⁶⁷ Over 1 in 10 Florida adults were disenfranchised for a prior felony conviction; criminal history had become a central tenet of eligibility — something drastically different from the 1838 and 1865 Florida constitutions, which focused on a narrow set of crimes related to election security. After decades of reform efforts, Amendment 4 reinstated voting eligibility to 1.4 million people who had completed their sentences.⁶⁸ Although criminal history will still bar from voting around 375,000 people excluded who are incarcerated, on parole or probation, or convicted of murder or a felony offense, the future Florida electorate might look dramatically different.⁶⁹

Recent changes have not exclusively expanded access; states have also restricted voting eligibility. In 2000, for the first time in its history since 1620, Massachusetts changed its constitution to narrow the franchise as it regards criminal history by preventing people incarcerated for felony sentences from voting.⁷⁰ The disenfranchisement in Massachusetts was yet another vindictive backlash against a new set of voters gaining political power. Again this was indicative of a “moral panic,” this time regarding the idea of prisoners organizing and voting.⁷¹ Future backlash is possible, especially once people

that enacting Amendment 4 would create an annual economic impact of \$365 million, create approximately 3,800 jobs annually, and create an increase in annual household income of \$151 million for Florida residents; see “Economic Impacts of Restoring the Eligibility to Vote for Floridians with Felony Convictions as a Result of Passage of Amendment 4,” The Washington Economics Group, Inc., 8 May 2018, <https://drive.google.com/file/d/1sP2BiK-CEmkjOiKjAgUBAwL75H5UP08/view>. (15 Dec 18)

66. In general, clemency procedures can often be onerous and confusing, for example requiring a DNA sample (until recently), a personal investigation, or a psychological evaluation. An analysis by Uggen and Manza concluded that “clemency processes simply do not appear to provide a viable remedy for most ex-felons,” Jeff Manza and Christopher Uggen, *Locked Out*, 89.

67. The process of restoring civil rights under the Rick Scott administration was challenged legally in a variety of iterations. The most recent result, regarding the case *Hand v. Scott*, found that the process which functioned only on discretion violated the 1st Amendment and 14th Amendment of the US Constitution. Much of this lawsuit, however, will be made obsolete due to Amendment 4's passing. Now, only people who have committed murder or a felony sexual offense will need to undergo the civil rights restoration process to regain voting eligibility; see *Hand v. Scott* (Northern District of Florida March 27, 18). <http://fairelection-network.com/wp-content/uploads/161-Judgment.pdf> (15 Dec 18)

68. Amendment 4 did not restore voting eligibility to people convicted of murder or a felony sexual offense. Additionally, it requires the full payment of restitution, precluding many low- and middle-income people from voting and potentially exacerbating political inequality; see Alexander, 159.

69. Probation - 218,600, parole - 4,566, incarcerated - 149,800; see Danielle Kaeble, “Correctional Populations in the United States, 2016,” *US Department of Justice Bureau of Justice Statistics*, 21 Jan 16, <https://www.bjs.gov/content/pub/pdf/cpus16.pdf>. (15 Dec 18) and Danielle Kaeble, “Probation and Parole in the United States, 2016,” *US Department of Justice Bureau of Justice Statistics*, Apr 18. <https://www.bjs.gov/content/pub/pdf/ppus16.pdf>. (15 Dec 18)

70. Note that in 1821 Massachusetts began denying the vote to paupers; see Keyssar, 274.

71. In 1997, people incarcerated in MCI-Norfolk created the Massachusetts Prisoners Association Political Action Committee (MPAPAC) to advocate for the interests of people who are incarcerated, as other PACs do. Politicians of every political persuasion, eager to assert their credentials of being “tough on crime,” decried the organizing and the Governor held a press conference advocating for

who are incarcerated and post-incarcerated more fully exercise their ability to vote.⁷² Other barriers to exercising the ability to vote are also increasing, especially since the gutting of the VRA in 2013 in *Shelby County v. Holder*. Discussions of eligibility to vote (e.g. on felony disenfranchisement) should take place alongside discussions of barriers to the act of voting itself (e.g. on voter purges, polling locations and accessibility, and strict voter identification laws), all of which can disproportionately impact African Americans. For now, the trend continues: since the Voting Rights Act of 1965, the most widespread challenge to voting eligibility for US citizens is still criminal history.

Conclusions and Implications

The history of felony disenfranchisement demands an understanding of the criminal legal system and the history of African American voting eligibility. The 15th Amendment and the Voting Rights Act of 1965 are key points in African American enfranchisement and likewise in the history of felony disenfranchisement. Before the Civil War, felony disenfranchisement stripped voting access from people who had committed fraud and other infamous moral crimes. The 15th Amendment provided access to voting for African Americans nationwide, but felony disenfranchisement policies expanded alongside other voting barriers such that African Americans could not utilize this franchise safely or legally. The third period in this history follows the Voting Rights Act of 1965 when other major barriers to voting fell. Since that time, felony disenfranchisement has been the principal policy preventing access to voting among African American communities, though there have been efforts to expand the franchise.

In the most recent campaigns for reform, many states have expanded voting eligibility to people post-sentence.⁷³ Voting rights advocates, racial justice organizations, and liberal groups have focused on this large portion of the disenfranchised population that is perhaps the most sympathetic to the American public. This work has resulted in millions of people now eligible to vote who would have been disenfranchised otherwise. This can be viewed as a first step in confronting disenfranchisement or a step towards compromise. However, these policies and their proponents have perpetuated the system that continues to disenfranchise people on parole or probation, people who owe restitution, people with histories of certain stigmatized crimes, and people who are incarcerated. For example, even after claiming that voting makes all communities stronger and that nobody's worst action defines them, Virginia Governor Terry McAuliffe did not consider voting eligibility for people who were currently incarcerated or under community supervision. This incremental change has ceded felony disenfranchisement of the few

the right to vote for people incarcerated to be written out of the Massachusetts constitution; see Keyssar, 274–275

72. Following the electoral victory of Doug Jones in Alabama Senate race, some conservatives advocated stricter policies against people incarcerated, both in Alabama and other states with strict felony disenfranchisement; see Aaron Klein, “Doug Jones Pushed Felon Voting ‘Rights’ with Soros-Funded Org.,” *Breitbart News Network*, <https://www.breitbart.com/politics/2017/10/26/doug-jones-pushed-felon-voting-rights-soros-funded-org/>. (15 Dec 18)

73. This has not met success at the federal level. A 2002 bill in the US Senate which would have permitted ex-felons to vote lost 63 to 31. Senators from states that had been part of the Confederacy voted against the bill 18 to 4. Senators, especially those from the South, opposed to the bill discussed states rights (McConnell and Allen) and the desire for an electorate that kept certain undesirable populations out (Sessions); see Manza and Uggen, *Locked Out*, 48–49; see U.S. Congress, Senate, *Equal Protection of Voting Rights Act of 2001*, S. 565, 107th Congress, 2nd Session, *Congressional Record* 148, part 14: S797–S830, <https://www.congress.gov/congressional-record/2002/02/14/senate-section/article/S797-1> (15 Dec 18)

as just.⁷⁴ Conservatives and racists have moved the entire discussion, skewing compromise. James Forman Jr. in *Locking Up Our Own* presents re-enfranchisement post-sentence as such a compromise, even while acknowledging that the disenfranchisement of all people incarcerated is unjust.⁷⁵ Incremental change is one thing, but moving the finish line in this way is another. Efforts that ultimately permit the legal disenfranchisement of people merit critical consideration, especially given the understanding of felony disenfranchisement as a tool of backlash to expanded voting eligibility.⁷⁶

The present implementation of Amendment 4 in 2019 is an additional example of disenfranchisement policies used as a backlash to expanded voting eligibility. Although advocates wrote the amendment to be self-implementing, the conservative state legislature has spent the current legislative session considering expanding the scope of who is still disenfranchised after Amendment 4.⁷⁷ One attempt is to expand the carve-outs for “murder or sexual offenses,” by excluding people who were convicted of attempted murder.⁷⁸ The current legislation would prevent voter registration for people with any outstanding fines or fees, moving beyond the restitution mandated by a judge as part of somebody’s sentence into areas of fees assessed by private debt collection agencies.⁷⁹ These policies would disproportionately fall upon African Americans and low-income Floridians. Although the current legislative session has not ended as of this writing, the events of 2019 thus far in implementation are additional confirmatory evidence to the pattern of backlash to expanded voting rights.

Recent movements towards re-enfranchisement are often not enough in the midst of other barriers. Even when eligible, people with prior felony records do not vote at expected rates due to a variety of factors.⁸⁰ The first is disenfranchisement by misinformation; the Campaign Legal Center estimates that up to 17 million Americans with past convictions are legally eligible to vote, but believe they are disenfranchised.⁸¹ Many people with prior felony records believe they cannot vote for the rest of their lives, even if this is not true in their states. Some people who are arrested,

74. There is certainly some push back. One group, Ballots Over Bars, connects people disenfranchised by Massachusetts people with free world allies who are not disenfranchised, such that people outside prisons can make the vote following the preference of someone who is disenfranchised, incarcerated in Massachusetts. These advocates express concern over the exclusion by Florida’s Amendment 4 of people convicted of murder or felony sexual offense, as well as people on parole, probation, and under incarceration; see Rachel Corey and Elly Kalfus, “Re: Florida’s 1.5 Million Missing Voters,” *The New York Times*, 14 Jan 18. <https://www.nytimes.com/2018/01/14/opinion/voting-rights-felons.html>. (15 Dec 18)

75. James Forman, *Locking up Our Own: Crime and Punishment in Black America*, First edition. New York: Farrar, Straus and Giroux, 2017: 236.

76. It is also important to confront illegal disenfranchisement that happens to people detained pretrial. The inability to vote from jail has impacted thousands of people. Simply legally having the ability to vote is not enough if people are not able to exercise it; see Danielle Root and Lee Doyle, “Protecting the Voting Rights of Americans Detained While Awaiting Trial,” *Center for American Progress*, 23 Aug 18, <https://www.americanprogress.org/issues/democracy/reports/2018/08/23/455011/protecting-voting-rights-americans-detained-awaiting-trial/>. (15 Dec 18)

77. Brendan Rivers, “DeSantis: Felons Voting Rights Amendment Shouldn’t Be Implemented Until He Signs Bill,” *WJCT Public Media*, 14 Dec 18, <http://news.wjct.org/post/desantis-felons-voting-rights-amendment-shouldn-t-be-implemented-until-he-signs-bill>. (15 Dec 18)

78. Steve Bousquet. “He Served Time for Attempted Murder. Should He Be Able to Vote? | Steve Bousquet.” *Sun-Sentinel.com*. Accessed April 14, 2019. <https://www.sun-sentinel.com/opinion/fl-op-col-bousquet-felon-puentes-20190314-story.html>.

79. Daniel Rivero. “Felons Might Have To Pay Hundreds Of Millions Before Being Able To Vote In Florida.” *WLRN*, January 20, 2019. <https://www.wlrn.org/post/felons-might-have-pay-hundreds-millions-being-able-vote-florida>.

80. Marc Meredith and Michael Morse, “The Politics of the Restoration of Ex-Felon Voting Rights: The Case of Iowa.” *Quarterly Journal of Political Science* 10, no. 1, 41–100.

81. Campaign Legal Center, Restore Your Vote, <https://campaignlegal.org/restoreyourvote/>

but never convicted, believe they cannot vote, even though this is not the case in any state. Many states use this misinformation as another kind of disenfranchisement; the law becomes a method of disenfranchising on its own, as an esoteric form of knowledge that operates on confusion.⁸² Sometimes it is even parole and probation officers who create misinformation, leaving many ex-offenders reluctant to register to vote even when they are legally permitted.⁸³ The second factor is intimidation. Some efforts sew fear in communities of color when they equate voting with a criminal record with “voter fraud.” Some precincts, documented in Florida and Mississippi, post sheriff deputies outside polling precincts, reducing turnout among justice-involved groups and communities of color generally.⁸⁴ A third barrier is the spatial concentration of felony disenfranchisement. People are more likely to be politically engaged if they are surrounded by other people who are. In some neighborhoods, a large portion of adults is disenfranchised. The remaining community members who are eligible to vote do so at drastically lower rates than expected, because people disenfranchised are excluded from political participation and conversations around it are less common.⁸⁵ The fourth reason behind low turnout among people with prior felony records is that disadvantaged groups vote at already low rates, even absent a criminal history. Felony records are not applied uniformly, and members of disadvantaged groups are much more likely to be targeted with felony records. Thus, voting participation among people with prior felony records faces an uphill battle. Just as there were extralegal barriers to voting during the backlash to Reconstruction, still today there are barriers beyond legal disenfranchisement.

Felony disenfranchisement has impacts far beyond the political sphere. Although voting and voting eligibility are overtly political, being eligible to vote is also access to full membership to society. Even though most opponents care primarily about preventing people of color and people with felony convictions from voting, they also stigmatize these same people beyond the voting booth which weakens communities, bars civic participation, and increases instability and potential recidivism. In some ways, it is unfortunate that all of the societal and personal harm that felony disenfranchisement policies create is just a byproduct of the political desire for power.

82. In 2017 the Alabama Secretary of State willfully permitted confusion because he wanted people to work to be able to register to vote: “As long as I’m secretary of state of Alabama, you’re going to have to show some initiative to become a registered voter in this state.” He even conceded, “Many voters might be discouraged from voting, because they don’t have time to pursue the matter.” People also had to swear under penalty of perjury that they were qualified to register to vote, without being provided the list of crimes that were disqualifying; see Anderson, 127–133.

83. Alexander, 160.

84. Anderson, 93.

85. Melanie Bowers and Robert R. Preuhs. “Collateral Consequences of a Collateral Penalty: The Negative Effect of Felon Disenfranchisement Laws on the Political Participation of Nonfelons*.” *Social Science Quarterly* 90, no. 3 (2009): 722–43.

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The Neanderthal Genome and Its Importance for Understanding Human Evolution

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Ancient DNA sequencing technology has recently become a powerful tool for researchers attempting to uncover the reasons why modern humans have survived while our closest species relatives, the Neanderthals, went extinct. This review summarizes current studies of the Neanderthal genome and how these data inform our understanding of Neanderthal population structure and the evolutionary relationship between Neanderthals and modern humans. Additionally, the implications of evidence of interbreeding between Neanderthals and modern humans are examined in terms of the fitness consequences and inferred functions of Neanderthal introgressed DNA in living humans, and the challenges associated with determining whether or not a variant is adaptive are also discussed. The Neanderthal genome has thus far proven incredibly informative for understanding Neanderthal populations and their relationships with modern humans, but additional work is necessary to link genetic differences between modern humans and Neanderthals to phenotypic differences that may have afforded modern humans a fitness advantage over the Neanderthals.

Introduction

Neanderthals, an extinct hominin species and one of the most closely-related species to modern humans (*Homo sapiens*), have been studied since 1856, when the first Neanderthal fossil was discovered (King, 1864). For most of their existence in scientific and public knowledge, all the information that was known about Neanderthals was based on the fossil and archaeological record. But, starting around twenty years ago, advances in DNA sequencing methods and technology allowed researchers to begin to study Neanderthal genetics. The Neanderthal genome has clarified the evolutionary relationship between Neanderthals and modern humans, and importantly, has presented evidence that our species interbred with Neanderthals. Moreover, studies have used Neanderthal DNA to determine levels of genetic diversity in Neanderthal populations, as well as infer characteristics of their population structure. Currently, research on Neanderthal DNA is focused on examining portions of the genomes of living humans that may have been inherited through interbreeding with Neanderthals, and determining what functional significance these variants may have, if any. Thus, analyzing the Neanderthal genome has the potential to inform studies of health and disease and the genetic basis for certain traits in living humans. Neanderthal DNA not only provides a better understanding of human evolution, but also can shed light on what makes modern humans unique.

Sequencing the Neanderthal Genome

Sequencing ancient DNA presents a suite of challenges. DNA begins to degrade immediately after the organism dies, and it tends to break down into short fragments of just 100-200 base pairs (Pääbo, 1989; Pääbo et al., 2004). Ancient DNA is also subject to chemical modification of bases, such as cytosine deamination, which changes cytosine into uracil. Moreover, the biggest concern with studying Neanderthal DNA is the risk of contamination with DNA from living humans. These challenges all need to be taken into consideration when attempting to sequence Neanderthal DNA, in order to produce a reliable result.

Comparing Neanderthal and Modern Human Mitochondrial DNA Variation

Mitochondrial DNA (mtDNA) is much more abundant in cells than nuclear DNA, making it easier to isolate and amplify in ancient, degraded samples. As a result, the first DNA sequences to be successfully isolated from Neanderthals came from mitochondrial DNA (Krings et al., 1997, 2000). Comparison of Neanderthal mtDNA to several modern human mtDNA samples showed that there was a greater number of differences between Neanderthal and modern human samples than between any pair of modern human samples (Krings et al., 1997). This demonstrates that the Neanderthal mtDNA lies outside the range of variation seen in modern humans, lending support to the classification of Neanderthals as a separate species. Furthermore, Neanderthal mtDNA was found to be no more closely-related to modern Europeans than to any other modern human group, and therefore, it was concluded that Neanderthals may not have contributed to the modern gene pool through interbreeding (Krings et al., 1997). Finally, Krings and colleagues estimated that Neanderthal and modern human mtDNA lineages diverged sometime between 550-690 thousand years ago.

However, these early mtDNA analyses are limited in that analyzing mtDNA is equivalent to using one gene to assess evolutionary relationships. Different portions of the genome are subject to different strengths of selection and mutation rates, as well as genetic drift, and thus using one locus may not accurately depict the evolutionary history of the two groups in question. Moreover, mtDNA is maternally inherited and is not subject to recombination, so it is more difficult to detect signals of interbreeding using mtDNA.

Early Nuclear DNA Studies

Over time, as DNA sequencing technology improved, along with advances in methodology for isolating and analyzing ancient DNA, the possibility of sequencing Neanderthal nuclear DNA became a reality. First, studies of Neanderthal nuclear DNA looked at specific genes that could be PCR amplified using primers developed from

the modern human sequence. One such study looked at *FOXP2*, a protein-coding gene that is highly-conserved among mammals, but in which modern humans have a nonsynonymous mutation that is thought to be important for the development of language (Krause et al., 2007). This study successfully amplified the Neanderthal copy of *FOXP2*, and found that Neanderthals share the modern human variant, leading to the conclusion that Neanderthals may have been capable of language. However, because this study did not sequence the entire *FOXP2* gene, its exact function in Neanderthals could not be determined.

Then, in 2010, the first draft sequence of the complete Neanderthal genome was published (Green et al., 2010). DNA was isolated from Neanderthal bones found in Vindija Cave in Croatia, and it was later determined that the bones belonged to three different individuals. Two of the three specimens could be dated using accelerator mass spectrometry (AMS) radiocarbon dating and were found to be between approximately 38-45 thousand years old, although subsequent analyses have dated these bones as older than 40,000 cal BP (Devièse et al., 2017). DNA sequencing reads from these three individuals were combined to produce the Neanderthal genome at approximately one-fold coverage (Green et al., 2010). While this level of sequencing depth is low, contamination with modern human mitochondrial and nuclear DNA was estimated to be below 1%, which increases the reliability of these results. With these data, Green and colleagues inferred the divergence time between modern human and Neanderthal autosomal DNA to be between 270-400 thousand years ago, based on an estimate of the modern human and chimpanzee DNA divergence date of 5.6-8.3 million years ago.

Evolutionary Relationships Inferred from the Neanderthal Genome

The most significant findings from the draft genome, however, are those related to comparisons of the Neanderthal and modern human genomes. Alignment of Neanderthal, modern human, and chimpanzee sequences revealed 78 nonsynonymous, derived nucleotide substitutions that are fixed in the human lineage, while Neanderthals carry the ancestral version (Green et al., 2010). These places in the modern human genome, in addition to other differences such as nucleotide insertions and deletions, potentially indicate unique traits in the modern human lineage. Additionally, it was found that Neanderthals are more closely-related to some modern human groups than others. Analysis of bi-allelic SNPs, where modern humans have two different alleles and Neanderthals have the derived allele, showed that Neanderthals, on average, matched the European and East Asian modern humans more often than they matched African modern humans (Green et al., 2010). Thus, it appears that Neanderthals are more closely related to living non-Africans than living Africans. This study estimated that today's non-Africans have between 1.3-2.7% Neanderthal DNA in their genomes, while modern Africans do not appear to have any Neanderthal ancestry. The most likely explanation for this finding is that gene flow occurred between Neanderthals and the ancestors of all modern non-Africans after they migrated out of Africa.

Subsequent Neanderthal nuclear DNA studies corroborated these earlier findings. In 2014, the genome of a Neanderthal individual from the Altai Mountains was sequenced to 52-fold coverage (Prüfer et al., 2014). A later study estimated the age of the Altai individual to be approximately 122,000 years old (Prüfer et al., 2017). This

high-coverage Altai Neanderthal genome was used to confirm the presence of gene flow from Neanderthals into contemporary non-Africans and to calculate the proportion of Neanderthal DNA in modern non-Africans as between 1.5-2.1% (Prüfer et al., 2014). This study estimated the divergence date between modern humans and Neanderthals at approximately 550,000 years ago, which is slightly earlier than the divergence date reported by Green and colleagues. Similar results were concluded using a 30-fold coverage genome isolated from a 50,000-year-old Neanderthal individual from Vindija Cave (Prüfer et al., 2017). Interestingly, analyses have detected slightly higher percentages of Neanderthal ancestry in East Asians than in Europeans, indicating that interbreeding either occurred to varying extents throughout Eurasia, or that Neanderthal ancestry in Europeans was diluted by gene flow from modern human populations that later migrated from Africa to Europe (Meyer et al., 2012; Vernot and Akey, 2015; Prüfer et al., 2017).

Gene flow has also been studied between Neanderthals and other Paleolithic hominin groups. One such group is the Denisovans, an archaic human population that is currently defined based on genetic information extracted from a finger bone and two teeth dating to between 30,000-50,000 years ago from Denisova Cave in Siberia (Reich et al., 2010; Meyer et al., 2012). Comparisons among Neanderthal, Denisovan, and modern human genomes revealed that Denisovans and Neanderthals have similar levels of average sequence divergence from the modern human genome and share more derived alleles with each other, indicating that Denisovans are a sister species to Neanderthals (Reich et al., 2010). Additionally, there is evidence of interbreeding between certain Neanderthal populations and Denisovans, and it is estimated that 0.5% of the Denisovan genome was contributed by Neanderthals (Prüfer et al., 2014). Denisovans also share more derived alleles with the Altai Neanderthal than Vindija and Mezmaiskaya Neanderthals, which suggests that the gene flow from Neanderthals to Denisovans originated from a Neanderthal population that was more closely related to the Altai Neanderthal than to the others.

Neanderthal genomes have also been used to analyze DNA from the Sima de los Huesos hominins, a group from Western Europe that is dated to approximately 430,000 years ago (Arsuaga et al., 2014). Morphologically, the Sima de los Huesos fossils appear to be related to Neanderthals, and genetic analyses corroborated this hypothesis, as the Sima de los Huesos individuals shared 40% of derived alleles with Neanderthals and less than 10% with Denisovans (Meyer et al., 2016). This suggests that the Sima de los Huesos population represents a group that is ancestral to Neanderthals, but not Denisovans. However, the Sima de los Huesos hominins have a mitochondrial genome that is more closely related to the Denisovans than to Neanderthals, which suggests that the mtDNA of later Neanderthals may have originated from subsequent populations migrating from Africa (Meyer et al., 2014, 2016).

Neanderthal Population Structure

The high-coverage genomes from the Altai and Vindija Neanderthals have also provided the power to uncover information about Neanderthal population structure. The Altai Neanderthal was found to have several, long regions of homozygosity in its genome, and an inbreeding coefficient of 1/8, which suggests that this individual's parents were as closely related as half-siblings (Prüfer et al., 2014). This led to the conclusion that inbreeding may have been a common

practice among Neanderthals. Moreover, analysis of the level of heterozygosity in the Altai Neanderthal revealed that genetic diversity among Neanderthals was extremely low; in fact, Neanderthal genetic diversity was found to be among the lowest measured for any organism, with 1.7-1.8 heterozygous sites per 10,000 base pairs. In contrast, modern humans have much greater genetic diversity in terms of heterozygosity, with levels ranging from 6-10 heterozygous sites per 10,000 base pairs. Similarly, the Vindija Neanderthal was found to have very low levels of heterozygosity, estimated at 1.6 heterozygous sites per 10,000 base pairs (Prüfer et al., 2017). Together, these results indicate that Neanderthals may have suffered a severe population bottleneck, or a series of bottlenecks, that caused a sharp decrease in genetic diversity. Neanderthals may also have lived in small, isolated populations with small effective population sizes of approximately 3,000 individuals, which limited the extent of genetic diversity possible in Neanderthal groups (Prüfer et al., 2017). But, the Vindija Neanderthal did not harbor such long regions of homozygosity as the Altai Neanderthal, indicating that the level of inbreeding observed in the Altai individual was not necessarily common among Neanderthals.

Thus, in comparison to mtDNA, nuclear DNA provides a greater breadth and depth of information about the evolutionary relationship between modern humans and Neanderthals, as well as between Neanderthals and other archaic populations. Most notably, the Neanderthal nuclear genome shows that Neanderthals did in fact contribute to the genetic diversity of living modern humans. This challenges a strict biological species concept, because it is evidence that while Neanderthals and modern humans were morphologically very distinct, they still were able to successfully interbreed and produce viable offspring. More importantly, however, the Neanderthal contribution to the modern human genome could have implications for the study of uniquely-human adaptations and of genes that confer disease risk.

Interbreeding Between Modern Humans and Neanderthals

Whole-genome studies determined that Neanderthals interbred with modern humans on the basis of a higher proportion of shared derived alleles between modern non-Africans and Neanderthals versus between modern Africans and Neanderthals (Green et al., 2010; Prüfer et al., 2014, 2017). However, an alternate explanation for this phenomenon is ancient population structure in the common ancestor of all modern humans and Neanderthals (Sankararaman et al., 2012). In this scenario, the ancestral population could have been subdivided so that some populations remain more closely related to each other based on geographic proximity. If this structure persisted, then the modern humans that migrated into Eurasia may have been genetically more closely-related to Neanderthals than the modern humans that lived in Africa, without any interbreeding occurring. One way to determine whether interbreeding or ancient population structure caused non-Africans to have approximately 2% Neanderthal DNA is to investigate the timing of last gene flow between the two groups. In the case of ancient population structure, this date would need to be before 230,000 years ago, which corresponds to the time that Neanderthals first appear in the fossil record (Sankararaman et al., 2012). If the higher proportion of shared derived alleles between Neanderthals and modern non-Africans was due to interbreeding, the date of last gene flow would

be expected to post-date the arrival of modern humans outside of Africa, around 100,000 years ago.

One method of determining the date of gene flow is by analyzing the extent of linkage disequilibrium (Sankararaman et al., 2012). Linkage disequilibrium describes the association of alleles at distant loci on a chromosome more than expected by chance (reviewed in Racimo et al., 2015). The length of the chromosomal segment between those alleles, and the similarities between that segment in Neanderthals versus in modern humans can be used to determine the date that the segment was passed down from the source population. Longer segments indicate more recent ancestry, as less time has elapsed for recombination to break up the segment. Analyzing the extent of linkage disequilibrium between SNPs shared with Neanderthals in modern humans demonstrated that the last gene flow from Neanderthals into the ancestors of modern humans likely occurred between 47,000-65,000 years ago (Sankararaman et al., 2012). Because this post-dates the appearance of Neanderthals in the fossil record and the arrival of modern humans in Eurasia, this evidence can be taken to support the hypothesis that Neanderthals did in fact interbreed with the ancestors of non-African modern humans.

This corroborates fossil and archaeological evidence that suggests that modern humans and Neanderthals lived near each other in the Middle East between 150-50 thousand years ago (Bar-Yosef, 1998). Interbreeding could have occurred here as modern humans began to migrate out of Africa. Additionally, dated artifacts from the earliest modern humans in Europe suggests that modern humans and Neanderthals overlapped in Europe for 2,600-5,400 years, starting around 45,000 years ago (Higham et al., 2014). The concordance of genetic and archaeological evidence, therefore, strongly supports the hypothesis that Neanderthals and modern humans did meet and were able to interbreed.

Selection on Neanderthal Introgressed DNA

After determining that interbreeding most likely occurred between Neanderthals and the ancestors of modern non-Africans in the Middle East or Europe approximately 50,000 years ago, the question becomes whether the Neanderthal DNA that persists in humans today remains because it was adaptive, or simply due to drift. Also of interest are the segments of the modern human genome that do not have any Neanderthal DNA, in other words, the regions where Neanderthal DNA may have been maladaptive and negatively selected against.

Potential Targets of Positive Selection

Just because an introgressed variant from Neanderthals has persisted in the genomes of modern humans today is not enough to determine that it confers some adaptive benefit to modern humans. The phenomenon of positive selection acting on introgressed segments of the genome because they confer a fitness advantage is called adaptive introgression (reviewed in Racimo et al., 2015). Under a scenario of adaptive introgression, individuals from the admixed population (in this case, modern non-Africans) not only have to be more similar genetically to the source population (Neanderthals) than the non-admixed population (modern Africans), but the introgressed variants also need to be at high frequencies in the admixed population and absent or at very low frequencies in the

non-admixed population (Racimo et al., 2017). Moreover, a potentially adaptive, introgressed variant is likely to function in some capacity that would confer a benefit on modern humans migrating from Sub-Saharan Africa into an Ice Age European environment.

One subset of potentially adaptive variants from Neanderthals includes genes that impact sun exposure-related phenotypes. A study that examined genotype and phenotype data from over 100,000 individuals in the United Kingdom found a haplotype near the gene *BNC2* that included a Neanderthal allele in 66% of individuals (Dannemann and Kelso, 2017). *BNC2* is associated with skin pigmentation, and this particular variant was found to be associated with increased risk of sunburn and poor tanning ability. A study that analyzed Neanderthal variants in Europeans and East Asians also found high frequency of Neanderthal ancestry in *BNC2* in European individuals, suggesting that the Neanderthal variant may have been positively selected in Europeans (Vernot and Akey, 2014). Another study found that a loss-of-function variant in the *MC1R* gene may be of Neanderthal origin (Ding et al., 2014). This variant, when present in modern humans, can lead to presence of fair skin and red hair. The variant is extremely rare in African individuals, but statistical tests were not able to detect signals of positive selection at this locus. Nevertheless, it is plausible that alleles influencing skin pigmentation may have been adaptive for modern humans moving into higher latitudes, as lighter skin allows for increased absorption of vitamin D, which is essential for proper bone growth, endocrine function, and immunity (Jablonski and Chaplin, 2010).

Another class of candidates for adaptive introgression are genes associated with immune function. One example is the gene *STAT2*, which is thought to play a role in immune signaling in response to viruses (Mendez et al., 2012). One particular haplotype on this gene is only observed in non-African populations and is detected at especially high frequency (approximately 54%) in Melanesian populations. Moreover, this *STAT2* haplotype in non-Africans shares a majority of derived alleles with the haplotype from the Neanderthal draft genome and is in extended linkage disequilibrium. Similarly, a subsequent study found that among Europeans, Neanderthal ancestry was enriched in regions of the genome that code for virus-interacting proteins (Enard and Petrov, 2018). Additionally, this study estimated that up to 30% of the long, high-frequency introgressed segments from Neanderthals in modern non-Africans may have been subject to positive selection due to viruses. Like skin pigmentation variants, alleles related to immune function may have been beneficial for modern humans migrating to novel environments. Genes inherited from Neanderthals could have given modern humans the ability to defend against pathogens that may not have existed in their ancestral African environment, which would in turn give them an increased likelihood of survival in Eurasia.

Negative Selection on Introgressed Neanderthal Variants

By comparing the Neanderthal genome to modern human genomes from populations that have Neanderthal ancestry, it is also possible to infer places in the genome where Neanderthal alleles may have been maladaptive. A 2014 study created an “introgression map” of Neanderthal alleles on non-African modern human genomes, and located several large regions where the genome was completely lacking in Neanderthal ancestry (Sankararaman et al., 2014). To determine if this was a result of selection, and not

simply a function of small population sizes and recombination, Sankararaman and colleagues tested for the density of functionally important genes in these regions. A positive correlation was observed between high density of functionally important genes and regions depleted of Neanderthal ancestry, suggesting that in these segments of the genome, Neanderthal variants were maladaptive. The largest Neanderthal DNA “deserts” were found on the X chromosome, and genes expressed in the testes were especially lacking in Neanderthal ancestry. Because males are hemizygous for the X chromosome, and thus deleterious alleles on the X chromosome are more likely to be expressed in males, these results suggest that Neanderthal genes related to male fertility were removed from the modern human genome by purifying selection. Another study found, similarly, that expression of Neanderthal variants was downregulated in the testes (McCoy et al., 2017). One gene in particular that was found to display downregulation of Neanderthal alleles is *DNAL11*, which encodes a protein involved in sperm flagella. These results suggest that male hybrids may have had reduced fertility and reduced fitness, which is why these regions of the modern human genome would be depleted of Neanderthal ancestry.

It has also been hypothesized that most of the introgressed Neanderthal DNA was actually slightly deleterious. Because Neanderthals had small effective population sizes, the effect of selection within the population would be relatively weak (Harris and Nielsen, 2016; Prüfer et al., 2017). This would make it easier for mildly deleterious alleles to persist in Neanderthal populations, and based on these assumptions, it has been estimated that Neanderthals were only approximately 60% as fit as modern humans (Harris and Nielsen, 2016). So, when modern humans and Neanderthals interbred, the percentage of Neanderthal DNA in the admixed population would be expected to decrease sharply shortly after the earliest interbreeding events, as the effect of larger population size and stronger selection in modern humans took over. In fact, this seems to be the case, as a study analyzing ancient DNA from European modern humans that lived between 37,000-14,000 years ago demonstrates that the proportion of Neanderthal DNA declined steadily from approximately 4% shortly after interbreeding to the 2% observed today (Fu et al., 2016).

Discussion

The results of studies examining selection on Neanderthal DNA in modern human genomes and the adaptive hypotheses explaining why selection acts in certain ways on certain parts of the genome are certainly promising. However, there is still quite a bit of controversy surrounding the methods used to determine selection. One major consideration is that there is currently simply not very much genomic data from Neanderthals. Today, full genomes are only available from eight Neanderthals, which limits the extent to which inferences can be made about Neanderthals on a population level (Hajdinjak et al., 2018). However, it will likely be just a matter of time before more Neanderthal individuals with well-preserved DNA are found and sequenced, and this will improve our power to understand Neanderthal traits and population structure.

Additionally, even with the vast numbers of genomic data available from living humans, it still remains difficult to rule out drift and population size effects when determining whether or not selection has acted on a specific variant for some adaptive reason. One study created a model to test the strength of selection on Neanderthal

alleles and found that the proportion of Neanderthal ancestry in modern humans today could simply be a result of differences in effective population sizes between Neanderthals and modern humans (Juric et al., 2016). In modern humans with larger population sizes, Neanderthal alleles that may have been neutral in their phenotypic effect may have been selected out simply due to the fact that selection is stronger in larger population sizes. This means that incompatibilities between modern human and Neanderthal genes may not have been necessary for the proportion of Neanderthal DNA in modern humans to decrease to the levels observed today.

In terms of positive selection, it is also possible that Neanderthal variants that remain in contemporary humans did not remain because they conferred a direct fitness benefit on modern humans. An alternative explanation for the persistence of Neanderthal DNA in modern humans is heterosis, or a rise in frequency of Neanderthal alleles at loci where they served a protective effect against deleterious modern human alleles (Harris and Nielsen, 2016). In other words, the introduction of a Neanderthal variant could have decreased the chance of a deleterious modern human allele from rising to high frequency, and the Neanderthal allele was allowed to remain as a result, without having any specific beneficial function. This could be one reason why along the modern human genome, Neanderthal ancestry is mostly heterogeneously distributed, with each Neanderthal variant occurring at relatively low frequency, and individuals varying widely with respect to where Neanderthal DNA is found in their genome (Vernot and Akey, 2014).

However, it seems unlikely that all of the Neanderthal DNA that persists in non-African genomes today would be phenotypically neutral. Some of the variants inherited from Neanderthals, such as immune and pigmentation genes, likely conferred an adaptive benefit on modern humans and should be credited for their role in the successful expansion of modern humans throughout the world. Nonetheless, it is also important to recognize that many of the phenotypes that have been found to be associated with Neanderthal ancestry thus far are highly polygenic and have complex genetic-environmental interactions that have yet to be fully explained. For example, skin color is influenced by multiple genes, each with a small individual effect, and so even with living humans, it is difficult to predict an individual's skin color based on their genotype (Dannemann and Kelso, 2017). Furthermore, sometimes Neanderthals seem to have contributed alleles that have opposing effects on the same phenotype. For example, the study that identified a Neanderthal variant at high frequency in British individuals on the *BNC2* gene associated with light skin and increased sunburn risk also found another Neanderthal variant on the same gene that is associated with darker skin (Dannemann and Kelso, 2017).

Finally, it is important to also consider that Neanderthal alleles may have slightly different effects in modern humans because the modern human genetic background is slightly different than that of the Neanderthal. This may, for example, lead to different epistatic effects in modern humans that may not have occurred in Neanderthals, and the phenotype associated with the Neanderthal variant in modern humans may not have been the same in Neanderthals. Genetic variants inherited from Neanderthals may also be expressed differently in modern humans because of our modern environment. Associations between Neanderthal alleles and traits like smoking risk, while interesting, are not extremely informative in terms of what the functions of those alleles were in Neanderthals because they were not subject to the same environmental pressures

(Dannemann and Kelso, 2017). However, with improved phenotypic data for living modern humans in clinical and non-clinical traits, we could eventually reach a better understanding of how the Neanderthal variants that persist today not only may have functioned in Neanderthals, but also how they may be influencing human health today. This data could prove to be extremely valuable for human health and determining disease risk for people with ancestry from populations with varying levels of Neanderthal ancestry.

Conclusion

In the last 10-20 years, a vast amount of information about how we are related to Neanderthals has come to light, thanks to advances in DNA sequencing methods. We can now say with reasonable certainty that the ancestors of all non-African modern humans interbred with Neanderthals, which is why people with non-African ancestry have approximately 2% Neanderthal DNA. There is still much that remains to be uncovered about what functions the variants we inherited from Neanderthals serve today, as well as why some parts of the genome have Neanderthal ancestry, while others do not at all. Multiple, plausible adaptive hypotheses have been proposed to explain these observations, and with more data in the future, we will hopefully be able to answer the questions that remain about the functional significance of Neanderthal DNA in living humans. Additionally, it is important to acknowledge that genetic data cannot describe every aspect of Neanderthal life, and fossil bones and artifacts are still necessary for understanding, for example, what Neanderthal culture was like. But, perhaps eventually we will be able to use inferences from Neanderthal genome to determine the traits that caused Neanderthals to go extinct, while modern humans survived to colonize the entire world.

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The Doubly-Disadvantaged: International First-Generation Students at Harvard

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First-generation students have increasingly become focus of research due to the specific struggles they have with academic adjustment and belonging in college, and for composing a significant part of the student population. International students on their behalf struggle with language barrier and with the process of acculturation. However, there is a gap in the literature about the experiences of first-generation international students. In this research paper, I study how this double background affects the college experience of students at Harvard. I interviewed eleven undergraduate students who are first-generation and international, who come from all parts of the world: Africa, Asia, Europe, and the Americas. I found that most of their experiences are aligned with what the literature suggests. An interesting finding is that they feel they do not fit either with first-generation or with other international students, feeling alienated in the community. At the end, I propose some suggestions for school administrators, such as to foster faculty-student mentorship relationship and the creation of a strong organization for international students with a focus on cultural adjustment.

Introduction

Working class families have been able to send their children more often than before to college these days. Despite the rising of tuition, numerous scholarships and increasing financial aid make the dream of higher education possible. Many of these are the so-called *first-generation* students, those who are becoming the pioneers in their family in attending a 4-year college in the United States. Being the first one in a family to attend college brings about many challenges, especially given the knowledge they lack in comparison with their non-first-generation peers. Challenges include, but are not limited to, difficulty in socializing, in *belonging*, struggle with the academic writing, lack of self-confidence in navigating the system, and vocational uncertainty.

Leaving the local for a moment, international students are becoming more and more essential for colleges to become multi-cultural and diverse. For generations, international students have attended graduate schools in the United States, either paying, or with comprehensive scholarships from their home countries. At the college level though, the background of the international students quite varies. Given that English is a basic requirement to apply to U.S. colleges, mostly all college international students attended bilingual, American, British, or international high schools in their home countries (unless they come from an English-speaking country, in which case the school of precedence does not matter). These students, in order to attend those high schools, must have parents who are financially capable to afford them. In order for them to acquire the financial capital to do so, they have probably at least completed an undergraduate degree. These parents have acquired, in their countries, a social and cultural capital at the college level, that allows them to pass on to their children, who now think of going to college as a normal step in life (in difference with the first-generation students in which college is almost a dream). Even when these students come to college to the U.S., they will have knowledge of how to do college in general terms, will have the self-confidence that their parents transferred them, and will feel they belong because for them college was a natural stage in their lives.

But what if there was a group of students who had the same

experience as the first-generation ones, but came from abroad? These are students that attended public schools (or charter schools), have working-class parents, and who received an education in the native language of their country. They probably only had a few hours of English language a week, had to support their families, and had never been abroad or to an English-speaking country before. They are brilliant in that overcoming these social boundaries and language, they end up in the national teams of their discipline. Then, U.S. recruiters, like EducationUSA, pay the costs for applying and these students are fully funded by the most elite universities in the country. Now, in college, they not only face all the struggles of a first-generation student, but also the barriers of being so suddenly immersed to another country, which customs, social codes, cultural and social capital, they lack. They struggle with belonging both to first-generation groups and to the international groups because they do not relate to their particular difficulties. Their struggle is tougher.

It is in this scenario that colleges do not know how to best help these students. There has not been data on the experiences of this particular group. My research brings light to Harvard administrators on how to better support the needs of these students, who, due to their lack of belongingness, consider taking time off, and even their lives.

My research question is the following: how does the background of first-generation international college students affect their experiences and challenges at Harvard?

Literature Review

A third of all international college students in the U.S. come from parents who did not attend college (Glass, Gesing, Hales, & Cong 2017). These correspond to the first-generation college students: students whose parents do not have a bachelor's degree (Glass et al., 2017). These students are triply disadvantaged: culturally, academically, and financially (Glass et al., 2017). First-generation students struggle to fit in, to feel they belong, to make friends, and to adapt to college culture (Rice et al., 2017). At Harvard College, first-generation students account for 15% of the student body ("First Generation Students | Harvard College", (n.d.)). Harvard College

also admitted 12.4% of international students to their Class of 2021 (“Admissions Statistics | Harvard College”, (n.d.)). International students encounter the challenge of having to respond to the rigorous academic demands at the same level as their domestic peers, but with the downside of being in an unfamiliar environment and experiencing feelings of insecurity and inadequacy due to language barriers (Gómez, Urzúa, & Glass, 2014).

Support from Faculty

In the framework of these challenges, support from faculty outside the classroom seems to reaffirm these students by creating in them a sense of community (Glass et al., 2017). Faculty are also a critical social resource for international students to adjust to college, for making contacts for work, and for career support (Arthur, 2017). In this sense, “faculty members play a significant role as bridges to sense of community and co-curricular engagement” (Glass et al., 2017).

Engagement with faculty, such as in office hours, or in getting feedback on assignments can enhance students’ learning outcomes, and school retention by 13% per meeting (Glass et al., 2017). Nevertheless, first-generation and international students show lower interaction with faculty than U.S. non-first-generation peers (Glass et al., 2017). Specifically, international students from lower socioeconomic backgrounds tend to have “more negative academic and social interactions with professors” (Glass et al., 2017).

Social integration of international students

Social integration of international students is key for their academic performance (Arthur, 2017), and for their cultural adaptation (Gómez et al., 2014). This integration can be achieved through support systems from faculty, counselors, and students (Arthur, 2017). One of the problems can lie in the ethnocentrism of classes, in which professors privilege the United States and dismisses the voice of other countries (Arthur, 2017). The lack of international perspective in the content may lead to student disinterest and poor interaction with professors (Arthur, 2017).

International students also show a harder time in the process of acculturation, defined as the “process of cultural and psychological change that takes place as a result of contact between two or more cultural groups and their individual members” (Gómez et al., 2014). In this sense, making friends with local students is key to reduce the chances of loneliness and homesickness (Arthur, 2017). However, most local students are usually less motivated to connect with students from other cultures, leaving international students to interact solely with other internationals (Arthur, 2017). This can lead to feelings of estrangement and alienation, which in turn can affect their academic performance and daily functioning (Elliot, Reid, & Baumfield, 2016). International students tend to first create friendships with students of the same region of the world they come from, or of the same ethnicity (Glass et al., 2017).

Social class in first-generation students

Social class differences can result in a disequilibrium upon arrival to college for first-generation students (Rice et al., 2017). Research reveals (Rice et al., 2017) that “social class is a salient concern for first-generation students,” and that students who had

exposure to wealthier peer prior to college had a better adaptation to college, in terms of social class differences. They also show that many of these students had to first confront their identities of social class when compared to classmates in college (Rice et al., 2017). Students reported that their hardships were due to the “possible influence of their race and/or ethnicity” (Rice et al., 2017). The awareness of their limited resources when compared to peers led them to experience discomfort and felt the pressure to adapt to the lifestyle of their classmates (Rice et al., 2017). The authors acknowledge that previous studies have understood this experience of not being able to fulfill the expectations of this new economic environment (college) as internalized classism (Rice et al., 2017).

Parents

Parent support also plays a role in support of first-generation students. Parents of first-generation students often encourage them to persevere and to work hard, but they lack the specific knowledge or resources on how to adequately support them in managing the demands of college (Rice et al., 2017). Given that first-generation students are unable to go to their parents to seek support, faculty play a critical role as a bridge for sense of community and for co-curricular engagement (Glass et al., 2017).

Sense of belonging

Sense of belonging at school is defined as seeing schooling “as essential to their long-term well-being, as reflected in their participation in academic and non-academic pursuits” and “relations with school staff and other students” (Chiu, Chow, McBride, & Mol, 2016). This sense of belonging may vary across cultures. A research that compared students from forty-one countries, revealed that students with immigrant families (in the United States) or spoke a foreign language at home had a lower sense of belonging at school, while those students with families in higher socioeconomic statuses, who had more books at home, or had greater socio-cultural communication had a bigger sense of belonging at school (Chiu et al., 2016). Belongingness has also been shown to positively affect academic success, with a greater impact on international students than on domestic students (Glass, & Westmont, 2014).

Language

One of the major challenges that international students face is that they have to overcome the language barrier. Students who struggle more with English language will have to first decode the message before they start learning it. They have to put extra effort in making sense of language, which opaque the understanding of the content, becoming doubly disadvantaged (Brunton & Jeffrey, 2014). That is why, the most important help that universities can provide to international students is a support in English language and study skills (Cownie & Addison, 1996). Even though universities set minimum standards in the use of English for admissions decisions, the “hidden expectations” of written and spoken English that come with settling into another culture are not measured by these entrance exams (for example, the TOEFL or IELTS) (Cownie & Addison, 1996). These hidden expectations correspond to culturally-specific norms of interaction in class, how to speak up in class, the codes used for writing papers, all of which are ingrained in the

society into which the international student moves.

As I have shown, there is little research on students who meet the criteria of being both international and first-generation students. That is why my research comes to fill this gap, providing light on their experiences so that we can better know how to support them.

Research Methods

For the purposes of this research, I studied the experiences and challenges of enrolled college students at Harvard University who met the following criteria: (1) They are **first-generation students**. This means that their parents did not attend form of tertiary or higher education. The reason for this specificity is that I wanted to understand the specific struggles of a generation who did not have access to a transfer of information from a parent, so that they have to mostly solve everything on their own, without the advice of their parents, who lacked the higher education knowledge of how it works. (2) They are **international students**. Because there are so many types of international students (some who were born in the U.S. but lived abroad all their lives, some who were born in a non-U.S. country and attended high school in the U.S., some who were born in a non-U.S. country and attended high school—usually an international one—abroad, but not in the U.S., among others), I only focused on **students who were born and raised outside the U.S. and never came to live in the United States before Harvard**. One of the expectations I had was that most of the students in this category would have attended public schools in their home countries. (3) They come from a home, high school, and country, which **primary language is not English**. In this way, I was able to see how these students deal with the struggle of settling into an English-speaking environment. I wanted to understand how they manage having classes in a different language from the one they were used to, in addition to the aforementioned challenges of being first in their families attending college and moving from one country to another as an international student.

The population I can generalize to with this research is the first-generation international students who study in the United States. This sample, although small, can represent at some extent this category for the following reasons. (1) First-generation international students require full financial aid, if not most of their tuition covered, and attend institutions that can provide it. These students, who most of the time come from a low-income background, need the financial aid universities grant for the entirety of their studies. There are currently five universities in the U.S. that have need-blind admissions, meaning that the financial situation of the student is not a factor in their admission decision. These universities coincide in that they are top universities in the United States by the majority of rankings: Harvard, Yale, Princeton, Amherst College, and the University of Pennsylvania. Because these students need full-rides, they will most likely apply and end up matriculated at one of these five colleges. That is why, when studying students from this category who attend Harvard University, we can generalize for the rest. (2) First-generation international students are extremely accomplished, and as such, they will aim for the best universities in the United States: national champions in debate, robotics, sports, science, and entrepreneurs are only some of the outstanding recognitions of these students. These are the type of first-generation international students who will attend the top U.S. colleges. Therefore, studying a small population of them at Harvard can enlighten us about the

bigger picture of the other colleges as well.

The specificity of the sample I studied made the data collection process very hard, because it was such a particular group of people I studied. My research population is found at Harvard College. I used the snowball sampling method, given that most first-generation international students know another peer. I started reaching out to the ones I already knew, those whom I had met through friends or through the Harvard College First Generation Student Union, or through the week-long Freshman International Orientation Program I participated in the summer before my first semester in the college. I sent out emails to the email lists of the former two organizations asking for students who met the three-part criteria of my methods and who were willing to participate in my study. I only found one student at Harvard College who met the three criteria (first-generation, international, and primary language non-English), so I had to expand my third category to include English speakers as well.

I interviewed eleven Harvard College students, from Africa, Europe, North and South America, East and South Asia. Three students were from Kenya, whose first language was English (Kenya's official languages are both Swahili and English). Two students from the U.K. One student from Mexico, whose primary language was Spanish but attended school in English since elementary school. One student from Argentina, whose primary language was Spanish but attended school in English all his life. One student from Ecuador whose primary language was Spanish but attended an English school all her life. One student from Bangladesh whose primary language was Bengali but attended school in English. One student from Nepal whose primary language was Nepali but attended high school in English. And different from all the rest, one student from China who attended a school in Chinese all her life. Eight of these students had never visited the U.S. before, with the exception of one British student, the student from Mexico, and the student from China. Five of these students are seniors, four are sophomore, and two are freshman.

The following are demographics I was interested in obtaining from them: extracurricular activities/job, home language, years of English instruction, if been to the U.S. before Harvard, parents' occupation, if there were others from their home country at Harvard.

In order to maintain confidentiality, I do not allude to the real names of the students when citing them, and the participants of the research were given the opportunity to opt-out of the research at any point. I audio recorded the interviews, and gave them a consent form.

Interview Questionnaire

- 1) Can you reflect on how Harvard compares to your home and high school life?
- 2) How well you think you integrated to Harvard? Any challenges?
- 3) How did you learn how to navigate Harvard?
- 4) How difficult has it been for you writing in English?

The rest of the information I obtained from the interviews came as follow-up questions to the main ones presented here.

Data Analysis

I did not take notes during interviews, but I did record the audios so I could listen back. I had a list of topics I wanted to cover during my interviews that I held in a notebook to which I would look once in a while during the interview. Those topics were language barrier, sense of belonging, parents support, social class, social integration, loneliness, professors support, and coping strategies. I started with fewer labels, but as I conducted more interviews I began to see patterns, so I included them in my notes for the following interviews. Such new patterns were the process of application to U.S. universities, discrimination, and relationship with international students from their own country. After conducting the interviews, I transcribed them and highlighted sentences from the students that were key answers in each of the questions asked. When reading all transcribed interviews, and focusing on the selected quotes, and informed by the literature, I organized the struggles of these first-generation international students in four categories: application process and parents' apprehension, language barrier, academic adjustment, and sense of belonging.

Presentation of Findings

This research had the objective of understanding the struggles and ways of coping of first-generation international students at Harvard College, in relation to how their background impacts their experience at Harvard. Based on the literature review, I was able to guide my questions and confirm many of the things that research has shown. I group my findings in four big categories: application process and parents' apprehension, language barrier, academic adjustment, and sense of belonging.

Application process and parents' apprehension

The interviewed students are extremely motivated. In their high schools, many times there were no counselors that could guide them in the process, and if there were, they did not have much information. This led to students to having to find out and learn about the admission process, requirements, college system (including classes, life on campus, organizations, resources), financial aid, taxes, and life in the United States on their own, and sometimes only through the internet. The motivation of these student is such, that despite nobody helping them in the process, they continue, even with hardships. Some students I interviewed had to get jobs as high schoolers to pay for their exams because they came from low-income families, and even one student had to travel from mainland China to Hong Kong to take the exams, and carry all the costs on her own, because of the unavailability of those exams in mainland China.

Being the only one who applies to U.S. universities from one's high school also presents another challenge: the lack of familiarity with the U.S. system. The students from Kenya were in a program in which they received some kind of guidance, and had access to peers who had already been accepted to U.S. colleges. In the other cases, they had nobody to reach out to. The student from Mexico attended a British school in the United Arab Emirates, and the only system the school was acquainted with was the British system. The student from Nepal, also did the International Baccalaureate program for U.K. admissions, but lacked the counseling for U.S. admissions. Although the students from Bangladesh and Argentina went to

English schools, the schools had never sent anybody to study abroad.

This lack of information available also impacts parents, because the information is not available in languages other than English, and students have to translate for their parents. Often times the more practical information that parents ask does not appear on the websites of the universities, specifically information that is embedded in the culture, including codes, norms, and language. Parents do not know what to expect. Although supportive throughout the process in the way they can, they fear losing their child to some foreign world they do not know.

Language barrier

Language is inevitably embedded in culture. Harvard is a highly selective school, so they require students to comply with a minimum score of the TOEFL (Test of English as a Foreign Language), but that exam does not measure cultural understanding of the language. When students move to the United States, with very high command of English, it becomes extremely hard to engage in informal conversations, because the only English they know is the one used in academic settings. With the exception of the students where their country's official language was English (U.K., Kenya), these students never had exposure to the American culture, or were immersed in an English-speaking culture before Harvard. This limits their participation in informal conversations, and makes them feel frustrated because they cannot interact, even with the other international students who come from English-speaking countries. One student said, "I didn't know how to talk," referring to casual conversations during the Freshman International Program.

Academic adjustment

A major challenge is the academic acclimatization, in which they become, quoting one of the students "an anthropologist, trying to understand everything," learning how the system works, and all the norms that do not apply in their home cultures. For example, in most foreign cultures, there does not exist a culture of reaching out for help, or going to office hours, but in the U.S., seeking help is key to succeed. At the same time, homework and writing assignments are not as important for the final grade as are exams, while at Harvard every little piece of homework, even participation, counts for the final grade.

Most of the introductory classes assume some level of preparation. Students realize that they have gaps in knowledge, and that not all of them have the same level of preparation. Even writing papers is not something that is enforced in high schools outside the United States, so students already come disadvantaged when they face their first writing assignment. Some of them can barely write one page, and when they are asked to write a ten-page essay for a freshman seminar, they feel hopeless because this is something in which they lack training. They had no way to prepare. That is why one student said that "the academic environment is tougher for international students." Nevertheless, these students think that, aligned with what the literature suggests, positive feedback from professors increase the self-confidence, because it is someone from within the system who is validating them and encouraging them to continue, despite their hardships.

Sense of belonging

Because they come from drastically different background than their American or other international peers, they feel that they cannot fit in within international students or within the first-generation students, given that they can't relate to their experiences and vice versa. This makes them feel lonely. Most of the interviewed students felt that they cannot relate well to the international students from their own country, or to the other international students because they come from different backgrounds. In the case of students from the same country, my respondents felt they cannot relate because they come from different socioeconomic backgrounds, different types of high schools, and thus it makes them feel uncomfortable. Sometimes they reach out to the people from their same country when they feel the need to talk about their culture of origin, but these first-generation international students realize that their national peers do not struggle as much as they do.

When discussing the experience of the internationals students that are not first-generation, my respondents acknowledges that this other group somehow knows how to do Harvard, and have a better experience overall, which is product of their place origin: their wealth, the school they attended, the support of their parents, and the sense of entitlement that those attributes produce in this second group of students. This disparity is seen starting early in the Freshman International Program, which the interviewed students agreed was more of a social week-long experience than an introduction to the U.S. Apart from that, there does not exist on campus an international-wide organization, except for regional groups (European Society, African Students Association, etc.) Those who come from Kenya, had an interesting case. The Kenyan students interviewed come from low-income backgrounds, attended public school, and then in 8th grade they took an exam to be assigned to a high school. All of them ended up in very competitive schools that allowed them to have the good preparation to apply to U.S. universities. These students told me that all Kenyan students at Harvard are from the same background, and thus they find refuge in being friends with each other, unlike the students coming from the rest of the world. Secondly, the First-Generation Student Union is mostly composed by American first-generation students, and although the struggles of American first-gens and international first-gens overlap in some ways, the interviewed students cannot relate to the experiences of their American peers and so they do not participate of the organization.

They also bring on their shoulders the responsibility of giving back to their home countries. They face a conflict of interests between pursuing their academic passions and maybe looking forward to jobs in the U.S., while at the same time with the responsibility of going back to their home countries to contribute in their field. Depending on the field, for example, Computer Science or Physics, the job market will be more rewarding in the U.S. than in Nepal. Or if it is Art, there are more opportunities in the U.S. than in Ecuador. But then there are difficulties obtaining a work permit and applying to specific jobs or internships that international students cannot afford. This responsibility with back home is also reflected in that four of the eleven students interviewed work on campus part-time to send money to their parents. Although their parents do not support them financially and little can they support in terms of college advising, these students realize that "what we earn in a week is probably what they earn in two or three weeks."

Discussion and Suggestions

The first-generation international students of this research have done everything they can to make their experience at Harvard smoother. They reach out to the Bureau of Study Counsel, the Writing Center, professors, and other international peers, and although these resources have helped them navigate the academic spectrum, they have not provided them a sense of belonging or of fitting in. Their parents' perception of what life in the United States and particularly college life at Harvard looks like comes only from the information provided from their children, and although Harvard sends regular emails to parents, the English of the email presents a barrier between some parents and the university. That is why, one of the suggestions is providing more in-detail information for parents and students before applying. Because back home these students do not count with counselors acquainted with the U.S. college system or even life in the United States, parents and students make decisions informed only by what the Harvard website says. With the impossibility of these parents to afford an air ticket for their children to visit, Harvard becomes a virtual place. Admissions information in the major spoken languages would increase the understanding of parents and students and will provide them some realistic expectations upon arrival.

These first-generation international students have also mentioned that mentorship programs that include having an adult mentor have provided to be helpful in navigating life at Harvard. Either in the form of a First-Generation Alumni Mentor, a faculty who is an academic advisor, or alumni from the Host Family Program, these adults give them the guidance that their parents cannot provide. However, they mentioned that it is unfair that some students get world renown scholars as their academic advisors, while others get a graduate student who happens to be their proctor, not because of the value associated to each person, but because a university authority figure, as the literature suggests, increases first-generation international students' self-confidence and engagement in extracurricular activities. One student said that mentors "need be first-generation college students themselves, or have been trained by people intimately familiar with the challenges that students like me face. They need to send more than concern emails, they need knock on our literal doors, and they should be compensated by their work as mentors." Providing more spaces for faculty-student relationship could be a way for these students to learn how to do Harvard from someone who can tell them exactly what is it that it is required of them.

One of the key reasons for the lack of belonging of the first-generation international students, is that there is not an organization that gathers international students, regardless of whether they are first-generation in their families or not. The Freshman International Program organized by the students that compose the Woodbridge International Society is a week of pre-orientation for international students that aims at introducing them to life in the United States. Nevertheless, the students I interviewed who attended FIP said that it was more of a social week where they made their first friends, but that little they learned about how to navigate being away from home, or the hardships about being international at Harvard. The students I interviewed who did not attend FIP because they either attended a different program or did not participate in any, said that they think they would not have benefited from FIP because it has the reputation of being mostly a social orientation to make friends. They also

included that Woodbridge is run by the wealthiest internationals, and from the beginning of the orientation there is a marked difference between those who feel confident in talking and those who do not have the cultural codes to express themselves. One student even said, "I didn't know how to talk. I felt so incompetent. I would let them talk but I wouldn't know what to say to participate. I was there, but just listening." That is why, there needs to be an inclusive organization for international students with presence throughout the year, not just during a pre-orientation week, that could invite speakers, have constant information sessions for international students, and facilitate conversations among the community about what it means to be international at Harvard, just like it is done with the First-Generation Student Union, the BLGTQ office, or with racial and ethnic groups. One cannot pretend that a person coming from another country adjusts in only one week in August. International first-generation students need support throughout all of their years at Harvard.

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Bint al-Nil, Daughters of the Nile: Tensions and Reconciliations within the Egyptian Feminist Movement in 1940-50's Egypt

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This paper explores the relationship between Egyptian nationalism and feminist activism in 1950's Egypt through the lens of *Bint al-Nil*, the eponymous Arabic-language journal of the women's union "Bint al-Nil." Doria Shafik, founder of the *Bint al-Nil* union and journal, published several articles, op-eds, and personal musings throughout the journal's circulation between 1945 and 1957. This project closely examines four of these writings, published between 1948 and 1954, in order to understand how the Egyptian women's movement situated itself within the broader ideological landscape of pan-Arabism, nationalism, and feminism. It was amidst this political milieu that Shafik sought to establish a movement for all Egyptian women. However, a more careful look at Shafik's writings and activism reveal implicit class biases that effectively disenfranchised many women from participating in her movement. The goal of this project is to shed light on the brand of feminist discourse promulgated through the *Bint al-Nil* journal, while also offering a candid look into some of Shafik's ideological inconsistencies.

Introduction: Doria Shafik, Daughter of the Nile

"The Egypt I knew in my early years was an Egypt awakening from a thousand years' step, becoming conscious of its long sufferings — that it had rights! And I learned in my early childhood that the Will of woman can supersede the law."¹

Thus muses Doria Shafik — poet, author, and face of the liberal Egyptian feminist movement in the 1940's — on her "awakening" as a feminist. Without question, the history of women's activism in Egypt is full of dynamic characters like Shafik. The years 1919 through 1952 are dubbed the "liberal age" in Egypt, an era in which the nation sought to define itself in a post-war, post-colonial context. Hoping to improve their social, political, and legal status, women in this time mobilized by creating unions, organizations, and other civil society institutions (Mokalled 2016, p. ii). Lively debates about what the appropriate response to the "Woman Question" should be differed depending on the political ideology, education level, and class habitus of the debate participants. However, it is impossible to disentangle any feminist activity of the 1940's and 50's from the advent of Egyptian and pan-Arab nationalism. In addition to defining what womanhood, liberty, and freedom meant to them, Egyptian women reflected on their place within the broader context of the nation. The rise of a thriving women's press further incentivized these debates, especially among middle and upper class women (Kamal 2016, p. 8). In the midst of this political milieu, Doria Shafik founded the *Bint al-Nil* (*Daughter of the Nile*) journal, and a union three years later of the same name (1945 and 1948, respectively). Through her writing and activism, Shafik "openly challeng[ed] every social, cultural, and legal barrier that she viewed as oppressive to the full equality of women."²

1. This quote was found on page 1 of Cynthia Nelson's book on Doria Shafik's life: *Doria Shafik, Egyptian Feminist, a Woman apart*. The quote originates from Shafik's memoir, published in 1975.

2. This is a sentence from the description on the back cover of Cynthia Nelson's aforementioned book.

Indubitably, Shafik influenced Egyptian feminist thinking and activism in many significant ways. However, for all of Shafik's achievements, there are notable discrepancies between what she attempted to accomplish and what she actually did through her activism. To her credit, Shafik endeavored to lead a feminist movement that encompassed women of all social classes; yet, for reasons perhaps overlooked, Shafik's journal ended up alienating a significant portion of Egyptian women. The Egyptian women's press in the mid-20th century was most valued by women in the upper and middle classes; this, compounded by the fact that almost 80% of Egypt's population was illiterate at the time, meant that it was nearly impossible for women of the lower classes to engage with Shafik's feminist writings (UNESCO 1957, p. 32). Moreover, while Shafik is widely considered by other scholars to be a progressive activist, her writings suggest that she retained a bit of a gendered outlook with regards to the capabilities of women. All the same, Shafik remains a pivotal figure for the Egyptian women's movement of the 20th century, and can certainly be considered a progressive activist within the context of her era.

To that end, the overarching goals of this paper are three-fold. Firstly, to situate the relationship between feminism and nationalism within a literature review that will assist the reader in understanding the political milieu of Shafik's feminist activism. To be sure, the "liberal age" in Egypt was time of burgeoning nationalism, which certainly influenced (and subsequently transformed) the feminist movement. The second goal is to provide the appropriate context under which the *Bint al-Nil* journal was circulated, which played a large role in alienating the lower classes. This paper will interweave relevant quotes and themes from Shafik's writings in *Bint al-Nil* as a way to understand these ideas from a first-person perspective.

Four articles — published in *Bint al-Nil* over the span of five years — were selected to explore this relationship between feminism and nationalism more closely. All were penned by Shafik herself and published originally in Arabic. These articles come from an online archive maintained by the American University in Cairo, which was originally curated by the Women and Memory Forum.³

3. The Women and Memory Forum is a non-governmental organization founded

The decision to include these articles was initially made by reading the titles and accompanying descriptions in the archive's catalog, which introduces the potential for selection bias. Nevertheless, these articles were ultimately selected for their ability to shed light on the way Doria Shafik articulated the relationship nationalism and women's participation in nationalist movements. This project strives to present a rigorous and conscientious account despite these weaknesses.

Motivations for writing this paper stem from a genuine interest in Egyptian feminist organizing and a desire to fill some of the glaring gaps in scholarship on this topic. Shafik's activism is largely overlooked in scholarship, as she is commonly overshadowed by her predecessor, Huda Shaarawi. Indeed, there are few rigorous studies dedicated to Shafik's activism alone, and even less on the *Bint al-Nil* journal. As of this writing, no systematic translation efforts of the *Bint al-Nil* journal have been undertaken. However, having these texts translated is crucial to the study of Egyptian feminism, as they articulate the thoughts, frustrations, and goals of the movement on its own terms, as opposed to the supposition of other (namely, Western) scholars. While the contribution here is small – translations of four articles out of several hundred – this project hopes to underscore the social and cultural contributions of Doria Shafik on the 1950's women's movement in Egypt.

Doria Shafik is fully deserving of the credit that she is given as a feminist activist and pioneer for the women's movement in Egypt. But, she is not without flaws. Activism is a complex and difficult endeavor, especially against the deeply entrenched forces of patriarchy. As such, the ultimate goal for this paper is to commend Shafik for her efforts while offering a candid look into some of her inconsistencies.

Egyptian feminist activism in the mid-20th century: feminism, nationalism, and Pan-Arabism

Before diving any further into mid-20th century Egypt or Doria Shafik's life, it is necessary to investigate the relationship between feminism and nationalism. This project strives to answer the following questions: what were the demands of the feminist movement during the mid-20th century? How did they conceptualize the woman's role in state-building activities? How did they perceive Western feminism, and where did they position themselves relative to it? To that end, this project draws upon the work of prominent historians of the Egyptian women's movement. Shafik's writings used to better understand the way she articulates responses to these questions herself.

The definition of the word "feminism" can change depending on the scholar and the region. For the purposes of this project, Kumari Jayawardena's definition of feminism is employed, which takes the context of the feminist movements in North Africa, parts of the Middle East, and Central Asia into account. Jayawardena defines feminism as "awareness of women's oppression and exploitation within the family, at work, and in society, and conscious action by women (and men) to change this situation"⁴ (Jayawardena 1986, p. 2). Consequently, feminist political ideas and actions encompassed all three levels of women's subordination (as listed previously) and

involve both men and women in a fight for equality (Subotic 2). Margot Badran echoes Jayawardena's definition when she describes Egyptian feminism in her own work: "Egyptian feminism - [is] a feminism advocating changes in everyday life, inside and outside the family, insisting at once upon complementary gender rights within the framework of the family, including a restructuring of Islamic family law, and the equality of rights for all citizens" (Badran et. al, 2).

Shafik's writings seem to endorse this academic description of feminism as well. True to the definition of feminism provided by Jayawardena, Shafik advocated for strong collaborative efforts between men and women — in Egypt and in the Arab world at large. Her article "*Toward a League for the People of the Arab world*" touches on this most clearly. In it, Shafik describes how both men and women engaged in discussions about "the feminist movement," and how they tried to find ways to "unite [their] struggle." Of course, Pan-Arab nationalism has much to do with this cooperation. The "Arab struggle," which affects all the Arab countries, is thus a quest toward autonomy. This shared struggle is what brings the Arab world, as well as men and women, together – especially because they share a "common enemy." In "Bint al-Nil Party," she expresses her frustration with polygamy and triple talaq, and declares that the union will work to "prevent the[se] transgressions" from harming the marriages of women. Reducing the frequency of these practices are Shafik's top priority within the home (or, in other words, "within the family").

The definition provided by Jayawardena also provides a basic framework through which we can begin to understand Egyptian feminist activist goals, as well as the targets of their activism (i.e. family structures, the workplace, society at large) throughout time. In the beginning of the 20th century, most work done by women's organizations focused on "philanthropic activities and social welfare as a way out of domestic seclusion" (Torunoglu 2016). Women participated in civic life by becoming teachers and holding other positions in the education system (Torunoglu 2016). In this way, we see how feminist began their campaign for their rights by ingratiating themselves in the public sphere — one of their three targets of activism. After World War I, women's groups began to align themselves with nationalist groups, participating and aligning themselves with the Wafd party. By then, their ambitions for engaging civic life had expanded. Women began publishing their writing in the women's press, hosting and coordinating public events, and entering the healthcare sector (Torunoglu 2016). The influence of the press influenced the private as well as public sphere; the movement's foray into healthcare was their way of influencing the workplace.

By the time Doria Shafik began her activism in the 40's, feminism encompassed all this and more. The 1948 Arab-Israeli War (Al-Nakba, as it is frequently referred to in Arabic), "became the rallying cry of [pan-]Arab nationalism" (Andoni 2009). Pan-Arab feminism was then "institutionalized" in the feminist movement, most notably by Huda Shaarawi through her work with the Egyptian Feminist Union in the early twenties (Andoni 2009). "*Toward a League for the People of the Arab World*" by Shafik reinforces this most clearly; this article is Shafik's declaration of support for pan-Arabism in every respect. In this article, she discusses her extensive travels around the Arab world and the energy she feels while discussing feminism and "the Arab problem" with people from Beirut to Ramallah. As a leader and activist, Shafik traveled a lot, which presumably brought greater publicity to the feminist

in 1995 with the goal of refuting "negative representations and perceptions of Arab women in the cultural sphere." (<http://www.wmf.org/en/>)

4. *Feminism and Nationalism in the Third World* was originally published in 1986, and focuses mainly on South Asia, but Jayawardena extends her argument to include countries in Africa and the Middle East.

cause (and to *Bint al-Nil* as a union and publication). Below is a translated excerpt:

...the idea of forming the Arab League was born in my mind, with the message to express the Arab well and connect the Arab struggle between all Arab countries that are seeking their freedom. And since freeing countries is freeing its men and women equally, the Arab League would be the field of struggle that gathers Arab women and men equally, so that they can share, side-by-side, the carrying of the flag of the holy struggle. And no one other than the people will have the power and belief that is needed to win the battle of freedom.

The nationalist struggle against Western powers is invoked again in “The Role of Women in the Arab Renaissance,” when she points to several countries across the Middle East and North Africa as gaining “nationalistic consciousness” against their occupiers. Thus, to form an Arab League would be to effectively combine all the “enthusiasm” across the Arab world and transform it into a “strong and decisive movement.” This article also reveals the strategic alignment of feminist and nationalist goals through impassioned rhetoric. The last few sentences evince this most clearly. Shafik claims, “freeing countries is freeing its men and women equally, the Arab League would be the field of struggle that gathers Arab women and men equally, so that they can share, side-by-side, the carrying of the flag of the holy struggle.”

In the early 20th century, Egyptian nationalism was hugely important to debates about “gender, class, and religion,” and “intensified” though the 1940’s (Mokalled 2016, p. 7). National consciousness in Egypt has a long and debated history⁵, but it was particularly important to the feminist cause during Doria Shafik’s activism in the late 40’s and 50’s. As it happens, nationalism took on a new life after World War I, “which resulted in placing Egypt under a British protectorate;” British presence in Egypt and its colonial legacy had a huge effect on identity construction in Egypt (Mokalled 2016, p. 8). Also important to the development of Egyptian national consciousness throughout history is Egypt’s geography, which is “well-defined” by the Nile (Ansari 231). Other contributing factors include “improved means of communication” and a long history of strong central governments (Ansari 1959, p. 231).

Where exactly does national consciousness fit into our definition of feminism, and when did this relationship begin? There are a few differences in opinion as to what the timeline actually is. Golley argues that feminist consciousness “developed hand in hand with national consciousness” in the early 20th century in response to colonial occupation (Golley 2004, p. 521). However, some Egyptian feminists proclaim they “had feminism before colonialism” (Basarudin 2005, 59). Others reject labelling women’s activism during this time as feminist at all, simply considering it a part of the nationalist spirit. Moreover, the awakening of a “national consciousness” in Egypt is also widely debated; there is no clear consensus as to when the relationship began. Regardless, one thing is for sure: feminist activity in Egypt in the early 20th century utilized (and capitalized on) nationalist sentiment in an attempt to further their agenda. Feminist groups (most notably the Egyptian Feminist Union and

Bint al-Nil) promoted nationalist activities as a method of achieving their own liberation. And thus, “the ‘Woman Question’ became a frontline in the struggle among Egyptians to define and defend a national culture” (Shakry 2008, p. 106).

Regardless of how Egyptian national consciousness came to be, feminist organizations like the Egyptian Feminist Union and *Bint al-Nil* readily accepted the new spirit of Arab 1950’s nationalism. Nationalism was based on “all-encompassing” factors like language, religion, and culture - things that were shared by (and hugely important to) Egyptian men and women alike (Mokalled 2016, p. 8). For this reason, nationalism was crucial to the ways in which women’s groups sought to “legitimize” their demands and activism (Refki 2018, p. 29). Aligning their activism within the nationalist context was strategic, as it allowed for groups like *Bint al-Nil* to appeal “to nationalist goals as compelling reasons to grant women rights and to utilize the full potential of the nation” (Refki 2018, p. 30). As it happens, feminist discourse also paired the idea of “[its] own liberation and advance with that of the nation” (Badran 3, 2005, p. 8). In this way, women’s groups stood up for the nation against “foreign occupation, economic, political and cultural imperialism” just as they were struggling for “women’s social, political, and economic rights” (Refki 2018, p. 30). This feminism fought wars on two fronts — against traditional patriarchal norms, and against Western influence.

Feminism and militant nationalism

Egyptian nationalism in this time was imbued by militancy. Perhaps most beneficial to understanding this militancy is to look to Shafik’s own writings about it. It’s a theme that comes up in frequently Shafik’s writing, most prominently in “Our Women are on the Field!” Written in July of 1948, Shafik laments the fact that women are unable to serve in the army alongside men. The exclusion of women has kept them from experiencing the glory of seeing the Egyptian flag rise on the battlefield, as described by Shafik:

We expressed our displeasure to the Ministry of Defense a year and a month ago because it forbade the Egyptian woman from the pleasure of looking at the English flag coming down from the castle and raising the Egyptian flag in its place. And that was an hour that half of the Egyptian people did not enjoy because of the administrators responsible at the time, and that was when they forbade our women the honor to see our great flag flying...

It is unclear what specific instance Shafik is referencing in this article. Regardless, she invokes strong nationalist sentiment to make her point. She then directly references the Arab-Israeli War. In May 1948, after Israel was declared independent, Egypt (along with Lebanon, Syria, and Iraq) sent forces to attack the territory. Even though the attack would end as a “humiliating loss,” the joint attack “reflected the spirit of Arab nationalism” at the time (Mokalled 2016, p. 92). Shafik references this military struggle in the second paragraph of “Our Women are on the Field!”

“And days have passed, and Egypt went to war to reprimand the criminals in Palestine, and the courageous army needed merciful hands to take care of its wounds

5. Zafar Ishaq Ansari (1959) wrote about the emergence of national consciousness in Egypt as starting from 1798, after the French invasion and subsequent occupation.

and to help with its struggle. And the army men looked around them right and left, and they found a group of female volunteers who came with no intention of gaining money, but they were driven to the battlefield because of their pure national consciousness” (Doria Shafik, *Our Women are on the Field!*, July 1948)

The war thus becomes an instance in which women demonstrate how invaluable they are to the survival of the Egyptian forces. Women volunteered on the war front to help heal the wounded; they did so because they were motivated by “their pure national consciousness.” Thus the relationship between nationalism and feminism is once again emphasized.

Shafik’s militant approach to activism is part of the reason why the *Bint al-Nil* Union was (and still is) considered far more radical in comparison to other women’s organizations operating in the first half of the 20th century. For example, Shafik orchestrated a thousand-strong storming (or, to some, an “assault”) on Parliament in 1951, and the following year, coordinated a ten-day hunger strike in 1952 (Jazzar 2001, p. 17). What’s more — *Bint al-Nil* organized the first female military unit in Egyptian history. The purpose of the unit was to “demonstrate that by sharing equal responsibilities with men in the armed struggle, women would be worthy of occupying their proper place in the political life of the nation” (Jazzar 2001, p. 17). Moreover, the unit emphasized the “common cause shared between women’s liberation and national liberation” (Jazzar 2001, p. 17). This belief in militancy characterizes much of Doria Shafik’s writings in *Bint al-Nil*. Though only one of the four articles translated explicitly mention militancy, there are many more to be found on the digital archives of the American University in Cairo. While this paper does not focus on the behavior of Shafik’s union, this knowledge provides a useful frame of reference through which to approach the study of the eponymous journal.

Nationalism and feminism - an impossible relationship? Nationalism as a gendered construct

The relationship between feminism and nationalism is particularly interesting to examine when we consider the ways in which nationalist ideals are gendered. Regardless of the time period or country, nationalism is typically “gendered in that it draws on socially constructed ideas of masculinity and femininity to shape female and participation in nation building” (Banerjee 2003, p. 167). Women’s most significant contribution to the nation is generally considered to be their ability to reproduce, a point underscored by Kaufman (2007). In Egypt, these very concepts were promoted in the early 20th century through the press. In 1922, barely 20 years prior to the founding of the *Bint al-Nil* journal, a cover of *Women’s Awakening Magazine* proclaimed “Awaken your women, and your nation will live...nations are made by men, and men by mothers” (Booth 1998, p. 171). The ways in which national consciousness is packaged within stereotypical gender norms is clear in this headline. The evidence speaks for itself: nation-building activities are relegated as the domain of men, and to women the task of raising strong men. Moreover, women are frequently used as the imagery through which the nation is promoted because they are “important symbols...used to create national identity” (Kaufman 2007, p. 1). To this point, consider Egypt’s informal (yet widely invoked) nickname: Umm al Dunya, Mother of the World. The bottom line:

women are seen as mothers when it comes to nation-building, no matter how you slice it.

Egyptian feminists in the 1940’s and 50’s sought to transform this gendered nationalist narrative through their own rhetoric and activism. As mentioned before, feminists like Doria Shafik appealed to nationalist beliefs as a way to promote women’s liberation. To do this, feminist rhetoric presented women’s liberation as inextricably bound to the success of the nation. Their argument hinged on this line of reasoning: that the nation would not be free until women were free, and women would not be free unless they helped free their nation. This logic is very evident in Egyptian feminist activism in general, and even more so apparent in the writings of Doria Shafik. In “The Role of Women in the Arab Renaissance,” Shafik promotes the idea of women as productive, capable, and selfless contributors to the nation. Below is a section from the article that demonstrates this most clearly:

...what is the role of women in [the renaissance]?

The answer to that question comes very quickly in the form of national struggle that the women in Marrakesh and Tunisia participate in...standing gladly in the face of violence and jail (and welcoming it). Not only that, but [they welcome] expulsion and even dying for the cause of their country’s freedom. And it comes in the form of the sweeping renaissance in Sudan and Jordan and Iraq. And it comes in the examples of progressiveness and civilization that are set forward by the women of Lebanon and Syria as the strongest proof of what a free woman can do for her country’s renaissance.

This quote reflects the opinion that women are deserving of the utmost respect and recognition for their role in the national liberation movement (which will lead to a “renaissance”). She references women across the Arab world who are “glad” to participate and lend their services to the nationalist struggle, braving the threat of jail time and assault. While she does not provide concrete examples of how women participate in these struggles, she again underscores the relationship between women’s liberation and the liberation of the nation. To this point, she repeats that no country can be free while its women remain “enslaved.” Women must be provided with opportunities to participate in civic life so that they are better able to “serve the Arab issue” at a time when human capital is desperately needed.

Even though Shafik considered women capable of combat (after all, she did advocate for the establishment of an all-female military unit), she inadvertently advocated for a different kind of female participation on the battlefield in the *Bint al-Nil* journal. Interestingly enough, the role women play in the article “Our Women are on the Field!” is that of a caretaker. In it, Shafik commends women for their “loyalty” to the Egyptian army and their willingness to volunteer their time as nurses. This is one of the most notable ways in which Shafik draws upon a gendered conception of women; even more telling of this gendered notion is the description of women as “nurses,” and not “doctors.” Not only does Shafik advocate for the role of women as caretakers, but she uses gendered language to describe women as well. For example, she likens Princess Fawzia to a bird. While birds come in many shapes and sizes (and of varying ferocity), the purpose of comparing Fawzia to a bird is presumably to emphasize her dainty, lady-like, and serene poise: “She flew like a

bird towards the sick and the wounded and she moved like a music piece that cured the ill / And through that she became a role model and gave a life example because she is in the field like an Egyptian woman who serves Egyptians,” Shafik writes.

Shafik confuses us once more in the first paragraph of the article “Bint al-*Nil*.” In the second sentence, she surprisingly proclaims that “it is not our purpose to work directly in politics,” meaning that the union itself will not directly engage in politics. She continues, stating that “it is not the engagement of women of women in politics that is our goal.” This is a discrepancy that is difficult to reconcile with Shafik’s work with the union. Does she mean that women are not supposed to be in politics? Strangely enough, Shafik staged multiple protests and demonstrations against the Egyptian government, and yet, she claims here that it is not her desire to work directly in politics. Indeed, this statement seems almost antithetical to her work and goals as an activist. It’s almost as if Shafik sees the boundaries of the “woman’s domain” as extending beyond the home, but not yet encompassing direct engagement in politics. Is it enough for Shafik that women lobby others to achieve policy changes, and not seek to participate in implementing those policy changes herself? Shafik never ran for public office or endorsed candidates, which at least is consistent with this revelation. Nevertheless, this is an important issue with which future scholarship can contend with further.

Egyptian feminism in a global context: Egypt and the West

The fierce nationalism that characterizes Egyptian feminism in this era was spurred partly in response to colonial legacies. For this reason, Egyptian feminism sought to distance itself from Western feminism, instead choosing to create their own (Badran et. al, 1995, p. 2). Indeed, Egyptian feminists viewed Western feminism as highly hypocritical, as it “demonstrated fundamental contradictions... [and] did not challenge colonialisms that deprived all citizens from suffrage” (Badran et. al, 1995, p. 2).

Be that as it may, the term “Western feminism” is one that many contemporary feminist scholars take issue with. The root of the issue is that Western feminism is not monolithic – different strands of feminism “have been generated in diverse parts of the West at various historical moments” (Badran 1). Bernardini (2012) corroborates: “so-called Western feminism has been questioned in the West,” and even Western feminist themselves oppose the term (Bernardini 2012). In any case, Egyptian feminists still felt the need to distance themselves from it. The West, as we will come to see, received the contempt of Egyptian feminists for more than just its “hypocritical” feminism — colonial legacies played a large role too. As such, understanding Egyptian feminism’s grievances with the West is greatly important to understanding the context in which Doria Shafik operated *Bint al-*Nil**, because these legacies helped spur the nationalist sentiment that would greatly affect feminist activism and rhetoric.

All in all, Shafik’s activism was uniquely imbued with nationalist and pan-Arab sentiment influenced by World War II, the Arab-Israeli War, and the remnants of British colonialism. Nationalism, while seemingly antithetical to feminism, was implemented strategically in feminist rhetoric such that women’s liberation was paired with the liberation of the nation. Indeed, to provide economic, social, and political equality for Egypt’s women would be to the nation’s benefit and ultimate success. With that in mind, Shafik’s

(and other feminists’) demands included women’s suffrage, changes to divorce and Personal Status Laws, the banning of polygamy, and increased educational opportunities (Torunoglu 2016). Harmful narratives portraying women as docile or subservient were also challenged, but not completely so, as the journal retained traces of gendered ideology.

Shafik and Islam: polygamy, triple talaq, and Bint al-*Nil*

The article “Bint al-*Nil* Party,” sets forth an ambiguous discrepancy about women and their participation in politics. But, what does *Bint al Nil* say about women and religion? Shafik has largely been classified by academics as a secular activist. Yet Shafik invokes Islam, as well as specific Islamic teachings, in her writing, suggesting that perhaps she is not as secular as others may think.

Over the course of the 20th century, the feminist movement had different relationships with Islam. Shafik’s era, however, is normatively considered “secular,” although Shafik uses Islam as a rhetorical device through which to gain leverage in negotiations. This is not to say that Islam was not important to Egyptian feminists in the late 40’s and 50’s. In fact, we will see shortly on how Shafik invokes religion in her writings, as she was significantly “shaped by the values of Islam” (Nelson 2004, xi). On the whole, though, Shafik’s movement respected “religious differences” and didn’t use any particular religion (in this case, Islam) as “its overarching framework” (Badran 2012, p.1). This would change in the late 80s and 90s, with the emergence of Islamic feminism, which as a movement itself was fraught with much conflict. While space does not allow for a thorough discussion on Islamic feminism, one thing is clear: Islamic teachings and texts were at the center of debate during the era of Islamic feminism, because they were the prime determinants of its boundaries. As such, Shafik’s secular feminism borrowed ideas from secular nationalism, Islamic modernism, and democratic ideals, which makes it distinctive from other strains of feminism (Badran 3, 2005, p. 6). Regardless of where feminism stood ideologically, research demonstrates how “women Islamists and the moderate nationalist feminists very often faced the same obstacles from society or the state and found themselves fighting on the same side for the same reforms and rights” (Jazzar 2001, p. 37).

Again, the word “secular” used to describe Shafik’s activism does not mean that was devoid of Islam. In fact, Shafik underscored the extent of her religious knowledge in *Bint al-*Nil**. For example, in the article “Bint al-*Nil* Party,” Shafik outlines her mission and impetus behind establishing the Union. Here, she expresses her frustration with the way men wield religion as a way to suppress women, especially with respect to marriage. In the second paragraph, she remarks: “there are those who govern over our affairs and remain stubborn and hide behind our benevolent religion or behind our obsolete traditions.” Moreover, she betrays her vexation at religious — or so called “pious” — men who leverage Islam in ways that are actually un-Islamic and controlling. At the same time, she demonstrates her knowledge of Islamic teachings in her discussion of polygamy and the strict rules that regulate its permissibility:

Is it not strange that polygamy is one of the elements [that is accepted] within marital life?... Many religious men see that God has permitted the marriage as limited by strict conditions - what they say is that polygamy can

cause dangerous situations and lead to the oppression of the wives in any circumstance if the husband does not act justly between them. And if the party that I have been calling for, comprised of Egyptian women, treated this problem from this side, and was able to implement the correct understanding of the ayah, it would be able to eliminate polygamy in the next coming generations.

Consistent with feminist demands of the time, Shafik's grievances relating to triple talaq (the practice of unilateral repudiation of the wife by the husband) and polygamy also reflect the feminist movement's broader aspirations for universal divorce rights and changes to Personal Status Laws. To this point, she specifically mentions "matters of marriage [and] divorce" as well as top agenda priorities for the newly-formed Union. In this way, we now see why feminists sought to reform the laws that mediated their relationships with men.

Is it not strange that a husband differs from his wife in one of the trivial matters of daily life, and around them are their children, and the man may utter a word, so that that woman who stood by him, supported him, all of a sudden has no ties to him⁶. And then the married life is just weaker than the threads of a spider web. And then the house that was so strong — that we built so we can live in until we enter the grave, and nothing can destroy it — one man can destroy it with one word without thinking or consciousness.

To this point, it's important to understand the Personal Status Laws, and the ways in which Egyptian feminists lobbied for their reform. In the broadest sense, Personal Status Laws are a series of laws that regulate romantic and familial relationships in accordance with shari'a (Islamic law). These kinds of laws can be found in many countries in the Middle East and North Africa (MENA) region, each country with its own variations. On the whole, though, Personal Status Laws govern the matters of marriage, divorce, child custody, and inheritance, and have been at the center of the Egyptian feminist agenda since the 1920's. As might be expected, they are subject to fierce ideological debates. The three major grievances, as articulated by Egyptian women, include "right of the man repudiate his wife, polygamy, and affirmation that men are superior to women" (Najjar 1988, p. 319). These grievances remain consistent from the beginning of the 20th century until Shafik's time.

In light of this information, it makes more sense as to why Shafik dedicates most of the "Bint al-Nil Party" article to discussion on polygamy and triple talaq. To her credit, Shafik also mentions the inheritance and education, the other two cornerstones of the Personal Status Law battle.

Bint al-Nil: a movement for all of Egypt's women?

As stated previously, the journal was founded in 1945 by Doria Shafik. By the time she founded it, she already had experience in the publishing industry through her work as editor-in-chief of *La Femme Nouvelle*, a French women's literary magazine. After facing significant criticism for her involvement with the French magazine

6. Shafik's discussion about the way a man can destroy a home by uttering "one word" can be confidently interpreted as an implicit reference to triple talaq.

— she was allegedly criticized for being "anti-nationalist" — Shafik took the practical knowledge she'd gained at *La Femme Nouvelle* and founded *Bint al-Nil* (Mokalled 89). In her own words:

"I wanted a magazine exclusively for women, especially Egyptian and Arab women. One that would concentrate on their problems since so many erroneous interpretations of the Quran were causing great injustice towards Arab women. A women's magazine could be of great help to the progress of my country as well as of all Muslim countries through reaching women among the broader Arabic speaking public with Bint al-Nil's message." — Doria Shafik (as quoted in Nelson 2004)

As it happens, Doria Shafik sought to include women of all classes (unlike her predecessors) not only in her feminist movement at large, but also in her journal, *Bint al-Nil*. This is because feminist activism prior to Doria Shafik's time was dominated by elite, upper class women. Of course, feminist political discourse in Egypt has a long and vibrant history, spanning — according to some sources — 150 years at the very least. Yet it was mainly the educated, elite-class of women who participated in this discourse until Shafik's time. Aisha Al-Taimuria, who is sometimes considered to be the first advocate for gender parity, wrote in 1894: "Oh, men of our homelands, Oh you who control our affairs, why have you left these females behind for no reason? ... you have been miserly in extending to these females the true adornment of humanity" (Younis 2007, p. 469). Taimuria, an aristocrat and poetess, embodied the way in which feminist consciousness was "first articulated among middle and upper class women" (Torunoglu 2016). This trend would persist until Doria Shafik attempted to expand the feminist movement to "include all social classes," as the lower class had been especially "alienated" by feminist activism in previous years (Mokalled 2016, p. 16). To that point, Shafik's activism is considered by some academics to have "contributed more directly than had the reformers of an earlier generation to the construction of an Egyptian feminist discourse" that engaged with women across various classes (Nelson, 2004, p. xii).

Yet there are several notable ways in which Shafik's journalism disenfranchised the very women she sought to include. *Bint al-Nil* found — not surprisingly — strong readership among the educated upper and middle classes (Nelson 166). Even so, Egypt's population was an estimated 80% illiterate, according to UNESCO reports (UNESCO 32). This means that the overwhelming majority of the entire Egyptian population could not engage with Shafik's journal, much less poor, urban women. If Shafik wanted to ensure her message was as wide-spread as possible, she could have chosen a more oral-based method of dissemination, as opposed to print.

Of course, this illuminates another tension between Shafik's intentions and her actions. As it happens, Shafik spent much of her formative years in West, having received a doctorate in philosophy from the Sorbonne (Mokalled 2016, p. 16). Her time spent in Paris meant that she became fluent in French and immersed in French culture. As such, Shafik was highly educated — in the West no less — which may have contributed to this blunder.

To her credit, Shafik tried to minimize the problem of illiteracy herself in order to a) make her journal more accessible to the lower classes b) improve women's status in general. Thus, part of Shafik's activism involved opening literacy centers for women who were uneducated. A New York Times article from 1954 reports

that *Bint al-Nil* operated 50 schools that provided literacy education to 2000 women (New York Times 1954). After the course of three months, 78% of women were then able to pass the literacy examination administered by the Ministry of Education. At the time, Shafik's goal was to attain 100% literacy in three years.

Be that as it may, *Bint al-Nil* was participating in the relatively new development of the women's press. Starting with the founding of the newspaper *Al-Fatah* (The Young Woman) in 1892, women's publications were barely more than 50 years old by the time *Bint al-Nil* came around. On this phenomenon, Kamal (2016) points out that "the rise of the national liberation movement encouraged reflections on the society and identity, leading to reconsiderations of socio-cultural and gender roles as reflected in the press, which opened up the discussion of such issues as marriage, divorce, polygamy, custody, education and work" (Kamal 2016, p. 8). Thus, the women's press was crucial to the flow of feminist discourse and the exchange of ideas at this time, especially at the height of Shafik's activism. Indeed, *Bint al-Nil* is said to be the first women's journal intended to directly engage — and awaken — feminist consciousness in Egyptian women (Nelson 2004, p. 125). *Bint al-Nil* would stay in operation from 1945 through 1957, until Gamal Abdel Nasser forcibly shut down both the Union and the journal (Torunoglu 2016). *Bint al-Nil* published monthly.

The American University in Cairo calls the journal "an important record of civic engagement and philanthropy within the Egyptian feminist community," but in reality it's much more than that. Despite its cosmopolitan marketing, *Bint al-Nil* gives us a valuable insight into feminist discourse in the 1940's and 50's. Indeed, despite its relatively short tenure, the twelve years of *Bint al-Nil* shed light on some of the tensions explored in previous paragraphs between feminism, nationalism, colonialism, and gender norms. Perhaps most striking is the way in which the journal underscores national pride and civic duty — a direct reflection of the complicated relationship between feminism and nationalism.

The materiality of the journal is an important consideration if we want to better understand how Egyptian women interacted with it. Keep in mind that it was Doria Shafik's goal to promote a brand of feminism that included women of all social classes, even though she effectively excluded the lower classes from it by choosing the print medium. As it happens, the journal itself was printed on "glossy" paper and sold for 10 piasters a copy; this alludes to the relative affluence and literacy of the target audience (Nelson 2004, p. 126). By looking at a few sample covers, we can see how this reality is exacerbated. The women who grace the covers of these sample covers (ranging from 1949-1955) are dressed to the nines, donning feather hats, expensive-looking jewelry, red rouge, and heels. To be sure, these women are quite stylish — but are they necessarily representative of the quintessential 40's/50's Egyptian woman? This is where *Bint al-Nil* falters a bit. It's clear from these images that a very specific type of woman graces the journal's covers — presumably wealthy, educated, and fashionable. One could even argue the women appear to be styled in Western dress (and perhaps even of European descent, as all the women are fairer-skinned). As such, it's more than likely that *Bint al-Nil*'s readership didn't extend beyond the upper and middle classes, even if its doctrine did.

Be that as it may, the most universal characteristic between these women and the readership of *Bint al-Nil* is that they are all unveiled. As it happens, during the 40's and 50's "going unveiled was a norm that bore little relation to [Muslim women's] level of

religious commitment" (Aspden 2011). Shafik herself dressed similarly to the women on the cover. Speaking at a National Council of Women meeting in the US, Shafik was described as "smartly dressed in a black wool jersey ensemble, her black hair covered with a vivid pink hat" (New York Times 1954). Thus the fact that the women on the cover are unveiled probably did not alienate the lower classes, given that unveiling was a normal practice.

Regardless of class biases, the legacy of the journal is an authentic and multi-faceted portrayal from this feminist era. The journal also included various types of media such as articles, hand-drawn cartoons, personal essays, and photos. Most noteworthy for the purposes of this paper are the writings of Doria Shafik. She would often include a short letter at the beginning of each journal, similar to "Letters from the Editor" that we see prefacing magazines today. The articles that were translated for the purposes of this project were all written by Doria herself; the goal of choosing articles penned only by her (and written in the first person) was to understand her personal conception of feminism and how it relates nationalism.

Doria Shafik faced many challenges during her years as a pioneering feminist, ones that unfortunately could not be discussed in greater depth in this paper. She was placed on house arrest in 1957 for publicly protesting against the Nasser regime, and fell into a deep depression as a result (Nelson 277). She spent the next 20 or so years writing a memoir and composing poetry. In September of 1975, Shafik tragically took her own life. During her time as an activist, however, Shafik had a profound impact on shaping the feminist movement. She attempted to make the movement accessible to women of all classes, education levels, and literacy rates. Moreover, she underscored the indispensability of the Egyptian woman to Egypt's social, political, and economic struggles. For these reasons, Doria Shafik will remain fondly remembered by Egyptian society for her efforts to the women's liberation movement.

"My country was in such a state of convulsion that one could not forecast all the accumulated storms. I felt compelled to enter the fray. It was not a question of simple curiosity but one of profound desire, blended with anguish, to touch with my own hands this great evil from which my country suffered and whose cause I could not yet grasp" — Doria Shafik (as quoted by Nelson 2006, p. 117)

Appendix

Figures 1-4



November 1955



February 1949



February 1952



April 1952

Note: For the sake of clarity and comprehension, these are not word-for-word translations. These translations were done to the best of my ability, but I recognize that they are imperfect. To produce this final product, I drew upon my knowledge gained in intermediate-level Arabic classes and relied on friends and family to help fill the gaps. Consequently, my sentence constructions and use of certain phrases may be influenced by the fact that I am a native English speaker. I also take liberties in punctuating and adding words in brackets for the sake of ease. Be that as it may, these translations were completed with the best of scholarly intentions.

“Bint Al-Nil Party”

This article, penned by Doria Shafik in March of 1949, describes the mission of the Party.

We have to complete the phenomenon [that] we have taken up and establish for it bases, and establish a party that will account for and fight for our rights [as women]. It is not our purpose to work [directly] in politics, as some [may have] understood from our articles, but rather we must think about it from the facet of [political] reform. It is not the engagement of women in politics that is [our] goal in a country where, to this day, there is yet no share of guidance [by women] in social matters.

And we take from our lives examples that show us to what extent are we in need of a party to include more people in our lines to face our social problems. And there are those who govern over our affairs and remain stubborn and hide behind our benevolent religion or behind our obsolete traditions.

Is it not strange that polygamy is one of the elements [that is accepted] within marital life? Is it not an honor for the party to be able to prevent the transgressions in the implementation of this rule? Many religious men see that God has permitted the marriage as limited by strict conditions - what they say is that polygamy can cause dangerous situations and lead to the oppression of the wives in any circumstance if the husband does not act

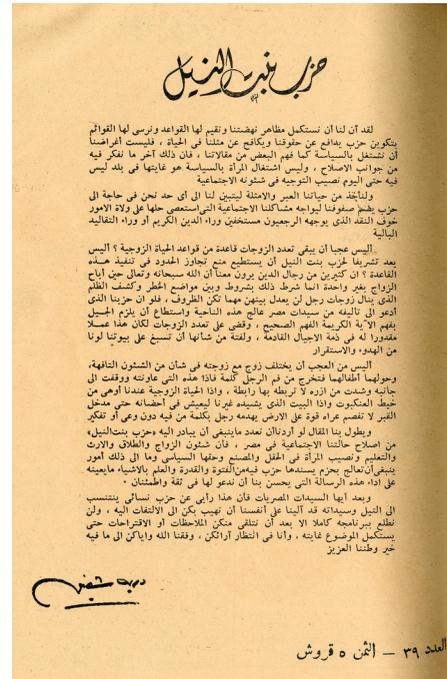
justly between them. And if the party that I have been calling for, comprised of Egyptian women, treated this problem from this side, and was able to implement the correct understanding of the ayah, it would be able to eliminate polygamy in the next coming generations. And this would be a landmark that will paint our houses in the colors of serenity and stability.

Is it not strange that a husband differs from his wife in one of the trivial matters of daily life, and around them are their children, and the man may utter a word, so that that woman who stood by him, supported him, all of a sudden has no ties to him. And then the married life is just weaker than the threads of a spider web. And then the house that was so strong — that we built so we can live in until we enter the grave, and nothing can destroy it — one man can destroy it with one word without thinking or consciousness.

We’re going to have a long discussion about what Bint al-Nil should do to improve our social status in Egypt. And the matters of marriage, divorce, inheritance, education, and the role of women in the workplace, including the farm or the factory, and her political rights should be treated seriously and it should be supported by a party that is strong, able, and knowledgeable, that will help the party execute this message that we should execute with calmness and confidence.

And then, the women of Egypt, for it is my opinion for a feminist party, that is related to the Nile and it’s women, we made a promise to ourselves to attract your attention to our party. And we will not come forth with a full program until we receive your feedback and comments until the entire subject reaches its aim. And I am waiting for your opinions.

And may God guide us and you to what is good for our dear country



“Toward a League for the People of the Arab World”

This article, penned by Doria Shafik in March of 1954, describes nationalist movements across the Middle East, and ends with a call for the establishment of a pan-Arab league.

I went to Beirut, Amman, Jerusalem, and Ramallah on my last trip around the Arab countries....and in every discussion, lecture, and meeting, the conversation continues between me and the men and women of those sister countries, [our conversations] revolve around the feminist movement and the Arab problems. Our opinions used to gather around one exact thing. At the moment I finished my invitation to gather the power of the

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men and women of the Arab peoples (so we can be united our struggle in our common battle that our Arab countries are conducting against our common enemy)...[incomplete sentence]...that enemy who makes alliances every day so that they can unite their occupying front against our Arab countries even though the occupiers have a lot of differences between them.

And from the moment I finished my talk about the importance of uniting the women's struggle with the nation's struggle to overcome the Arab problems, the audience erupts in support (shouting). But the supporting shouts were not everything, because there was only one question that begs an answer: what method can transform words and enthusiasm into an actualized, strong and decisive effort. And in this way, the idea of forming the Arab League was born in my mind, with the message to express the Arab well and connect the Arab struggle between all Arab countries that are seeking their freedom. And since freeing countries is freeing its men and women equally, the Arab League would be the field of struggle that gathers Arab women and men equally, so that they can share, side-by-side, the carrying of the flag of the holy struggle. And no one other than the people will have the power and belief that is needed to win the battle of freedom.

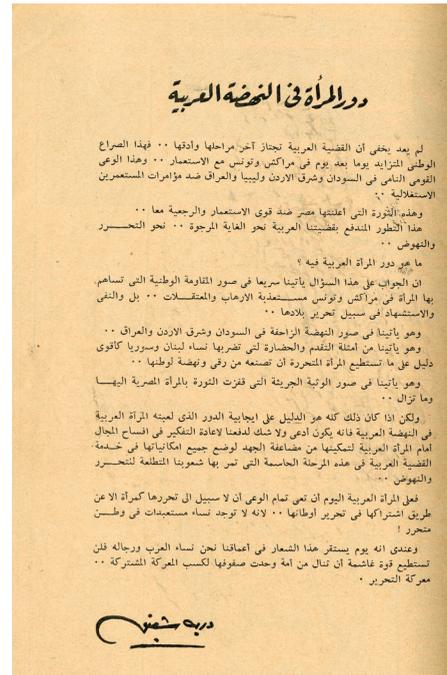
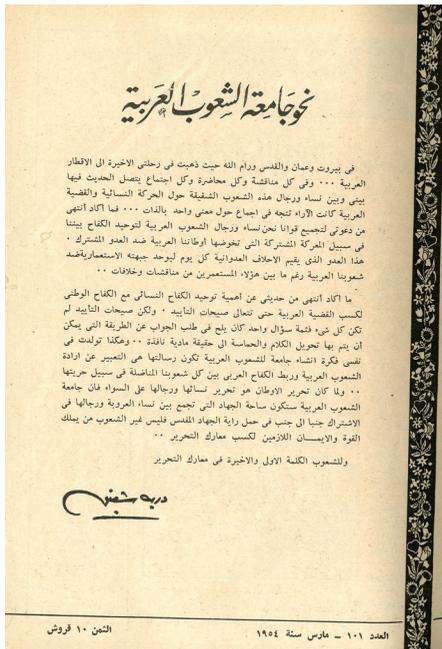
The first and the last word belongs to the people in the battle for freedom.

standing gladly in the face of violence and jail (and welcoming it). Not only that, but [they welcome] expulsion and even dying for the cause of their country's freedom. And it comes in the form of the sweeping renaissance in Sudan and Jordan and Iraq. And it comes in the examples of progressiveness and civilization that are set forward by the women of Lebanon and Syria as the strongest proof of what a free woman can do for her country's renaissance. And it also comes to us in the example of the big jump that the Egyptian women have accomplished (and continue to accomplish) through the Egyptian revolutions.

If all what I said before is the proof about the positive role that women have played in the Arab renaissance, this should undoubtedly make us think again about opening the door for women so that they can double their efforts and put all their capabilities towards serving the Arab issue in this sensitive stage that our countries aiming towards freedom and civilization are currently passing through.

It's on the Arab woman to understand clearly that there is no way to her freedom as a woman except through her participation in freeing her country. Because there should be no enslaved women in a free country!

And for me, the day that this slogan settles deep inside us, the Arab men and women, there will never be a destructive force that is able to hurt a nation united towards a common battle...the battle of freedom!



“The Role of Women in the Arab Renaissance”

This article, penned in February of 1954 by Doria Shafik, describes how women have contributed towards the “Arab Renaissance” (i.e. towards freedom and economic development).

It is not secret anymore that the Arab issue is passing through its last and most delicate stages.

And the nationalist struggle increases everyday in Marrakesh and Tunisia with the occupiers, and this growing, nationalistic consciousness in Sudan, East Jordan, Libya, and Iraq is working against the occupier's conspiracy to take advantage of them.

And [there is a] revolution announced in Egypt [which] goes against occupying powers and primitiveness. And this revolution pushes our Arabic issues towards a desired goal, and also towards freedom...

...what is the role of women in it?

The answer to that question comes very quickly in the form of national struggle that the women in Marrakesh and Tunisia participate in...[they]

“Our women are on the field!”

This article, published in July of 1948 by Doria Shafik, commemorates Egyptian women and their selfless participation in the Arab-Israeli war front.

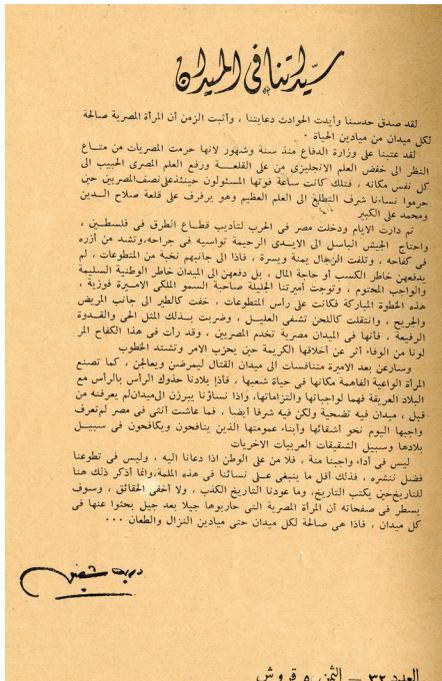
Our assumption was right and the event supported our claims and time proved that the Egyptian woman is capable in every field of life. We expressed our displeasure to the Ministry of Defense a year and a month ago because it forbade the Egyptian woman from the pleasure of looking at the English flag coming down from the castle and raising the Egyptian flag in its place. And that was an hour that half of the Egyptian people did not enjoy because of the administrators responsible at the time, and that was when they forbade our women the honor to see our great flag flying over the castle of Salah el-Din and Muhammad Ali.

And days have passed, and Egypt went to war to reprimand the criminals in Palestine, and the courageous army needed merciful hands to take care of its wounds and to help with its struggle. And the army men looked

around them right and left, and they found a group of female volunteers who came with no intention of gaining money, but they were driven to the battlefield because of their pure national consciousness and pre-determined duties. And our Princess, her royal highness Fawzia, approved of this blessed step and she was the head of women volunteers. She flew like a bird towards the sick and the wounded and she moved like a music piece that cured the ill. And through that she became a role model and gave a life example because she is in the field like an Egyptian woman who serves Egyptians. And she saw in that bitter struggle a type of loyalty that stemmed from her honorable morals in times of hardship and disaster.

And after her royal highness volunteered, a group of women rushed to the battlefield to help treating and nursing the wounded, as a smart woman who understands her role in the life of her people. And then our country went head-to-head with the civilized countries in understanding their duties and missions, and then our women went out to a field they had never been to before. A field that has sacrificed but also has honor. And there is no women in Egypt who doesn't know her duties and obligations towards her sisters and cousins who are struggling for the sake of her country and other Arab women's countries.

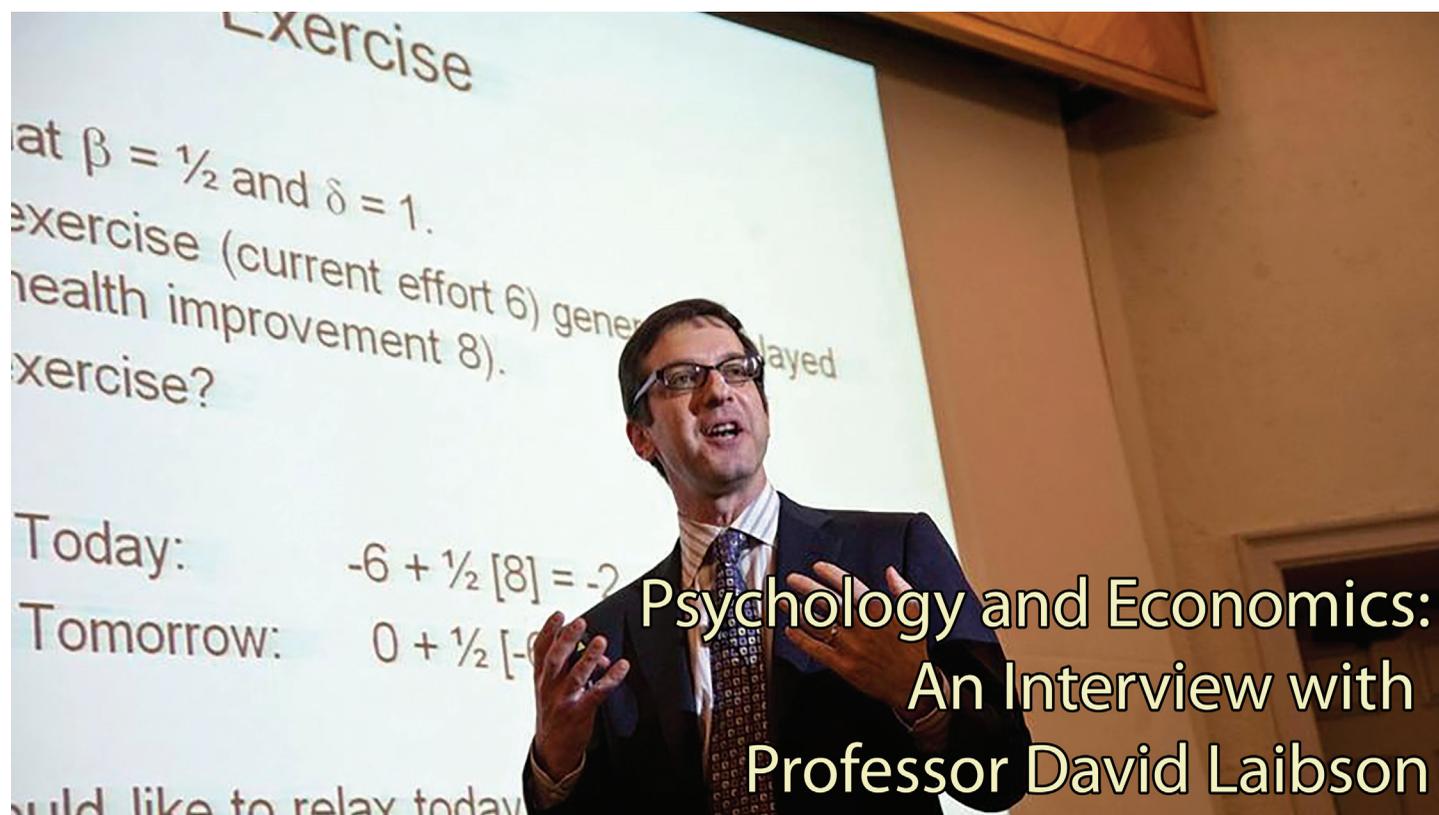
There is no favor in doing our duty, and there is no favor in our volunteerism that we can spread, because this is less than what our women should do in this mission. But I am just mentioning this here for the sake of history when history is written. And history does not lie nor hide the facts. And the history will write on its pages that the Egyptian woman who were fought one generation after the other was found in every field. [Indeed] she is suitable for every field — even the battlefield.



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Features



Apurva Kanneganti '20

The Robert I. Goldman Professor of Economics and incoming Faculty Dean of Lowell House, Professor David Laibson is a leader in the fields of behavioral economics and intertemporal choice and a well-known name at Harvard. This year, he will also be taking on another exciting role: co-teaching the large introductory class Economics 10. THURJ writer Apurva Kanneganti had the chance to talk to Professor Laibson about his research, career, and hopes for the field.

AK: Thank you so much for giving us this opportunity! To start off, would you be able to give us some quick background about your education and career thus far?

DL: Sure! I'm Harvard Class of '88, and I concentrated in Economics. I received a Marshall Scholarship and went to the London School of Economics for two years, doing some more economics there. After that, I spent four years at MIT getting my Ph.D. in economics, and then I came back and joined the faculty in 1994. I've been here ever since.

AK: When you were an undergraduate here, who or what do you think influenced your career choices and interest in economics?

DL: I do think that introductory economics classes transformed my view of the world and also my intellectual and professional aspirations. I took Ec 10 myself as an undergraduate. Before taking

that course, I didn't have the slightest idea how economics and economic insights give one a lens to understand the world. That course, along with so many other courses I took as an undergraduate, really helped me in many ways find my calling as an academic researcher. When I first got to college, I don't think I had a clue that anyone could study economics in an academic setting as a career. The experiences of taking classes with many brilliant and stimulating professors, even when I didn't agree with them, energized me and piqued my interest. When I was listening to economic ideas in class, I was sometimes thinking about the ways that those theories could be improved, and I saw a role for myself in that community of scholars and teachers and public servants.

“When I first got to college, I don't think I had a clue that anyone could study economics in an academic setting as a career.”

Thankfully, I was in a place where there were lots of faculty encouraging me to be creative and definitely encouraging me to think critically about economic theory and to ask what could be done to make economics better. Economists, at least at Harvard, acknowledged very readily that our profession's answers were incomplete and that there were many ways in which economics could be improved. I also felt that they were welcoming me to participate in that conversation. I worked as a research assistant for Ben Friedman,

and by the time I was a senior he had invited me to be a collaborator on one of his papers. My undergraduate thesis was advised by Larry Summers. That was certainly a great experience; I could clearly see he was a great mentor just like Ben was, and he encouraged me to be innovative and pushed me in whatever I did. I took courses from Greg Mankiw, Robert Barro, Eric Maskin, and Steve Marglin, all wonderful teachers and mentors who were instrumental to my education. I became more and more excited both about what economists knew and about what I thought we could know if we took economic science in a slightly different direction.

“There’s more and more data in the social sciences, and having the skills to understand how to work with data is a great starting point for anyone thinking about social science research.”

AK: And what direction did you think this was?

DL: You probably know that I’m a behavioral economist. That means that the classical assumption that people could be modeled as if they were perfectly rational and had perfect self-control struck me as mischaracterizing my understanding of myself and other people. I knew I wasn’t perfectly rational and didn’t have perfect self-control, and I also knew that I cared about things like fairness and how the pie gets divided. The fact that those things weren’t at the center of economic theory was a stimulus for me and made me excited to try to bring some of the missing pieces into economic research.

AK: How would you describe the research you’ve done thus far and the problems you’ve attempted to solve as an economist?

DL: I’m a jack of all trades economist. When I think about behavioral economics, I end up thinking about a set of questions that show up in many different fields of economics. I study situations in which people make choices about events that play out over time. Let me give you an example. Think about a student trying to decide when she should work on a problem set. Maybe she’s thinking, “Oh, I’ll get going on Friday so I don’t need to worry about it on Sunday.” Friday comes and goes, and the problem set hasn’t been started yet. Then she’s thinking, “Well, maybe I’ll get up early on Saturday and start fresh at nine thirty in the morning on my problem set.” And lo and behold, the problem set still languishes, and you see how this plays out. What I often study is why people struggle with these sorts of issues. There’s a concept that I’ve worked on for my entire career called present bias, which is the formalization of this

problem. The idea behind present bias is that when we think about today versus tomorrow, we tend to be very prone to push the hard work off till tomorrow and to put the fun stuff today. The problem is that when we get to tomorrow, tomorrow once again becomes the present, and then the same dynamic plays itself out again. My work is about modeling this human tendency to put a lot of weight on the present. I write down models that formalize these psychological ideas, analyze those models in economic settings, and then try to build environments that help people overcome the self-defeating behaviors that grow out of present bias. Sometimes these projects are theoretical, sometimes empirical, but they’re typically designed to help people do better in their lives. We’re trying to understand the psychological mechanisms that lead to self-defeating choices and then design policies that help people make better choices or that help them lead happier, healthier lives.

AK: Do you have any tips for undergraduates interested in pursuing such research, or social science research in general?

DL: Well, there’s so many different types of social science research. There’s qualitative research where the researcher goes into the community, talks to community members and tries to learn from their narratives, maybe observe people in their workplace. At the other extreme end of social science, you have the types of models and analytic tools that you might expect to see in a theoretical physics lab. Thus, the social sciences stretch all the way from research that is highly qualitative and contains very little mathematical formulas to work that is hard to distinguish from pure math, along with everything in between. The one thing that I think I would highlight for students today is that there’s more and more data in the social sciences, and having the skills to understand how to work with data is a great starting point for anyone thinking about social science research. That’s regardless of where you end up, whether it be anthropology, sociology, psychology, political science, or economics. Having foundational data skills, I think, will serve you very well in the long run. We’re all speaking the language of data now, and having that as your baseline skill is a very, very valuable way to begin a career.

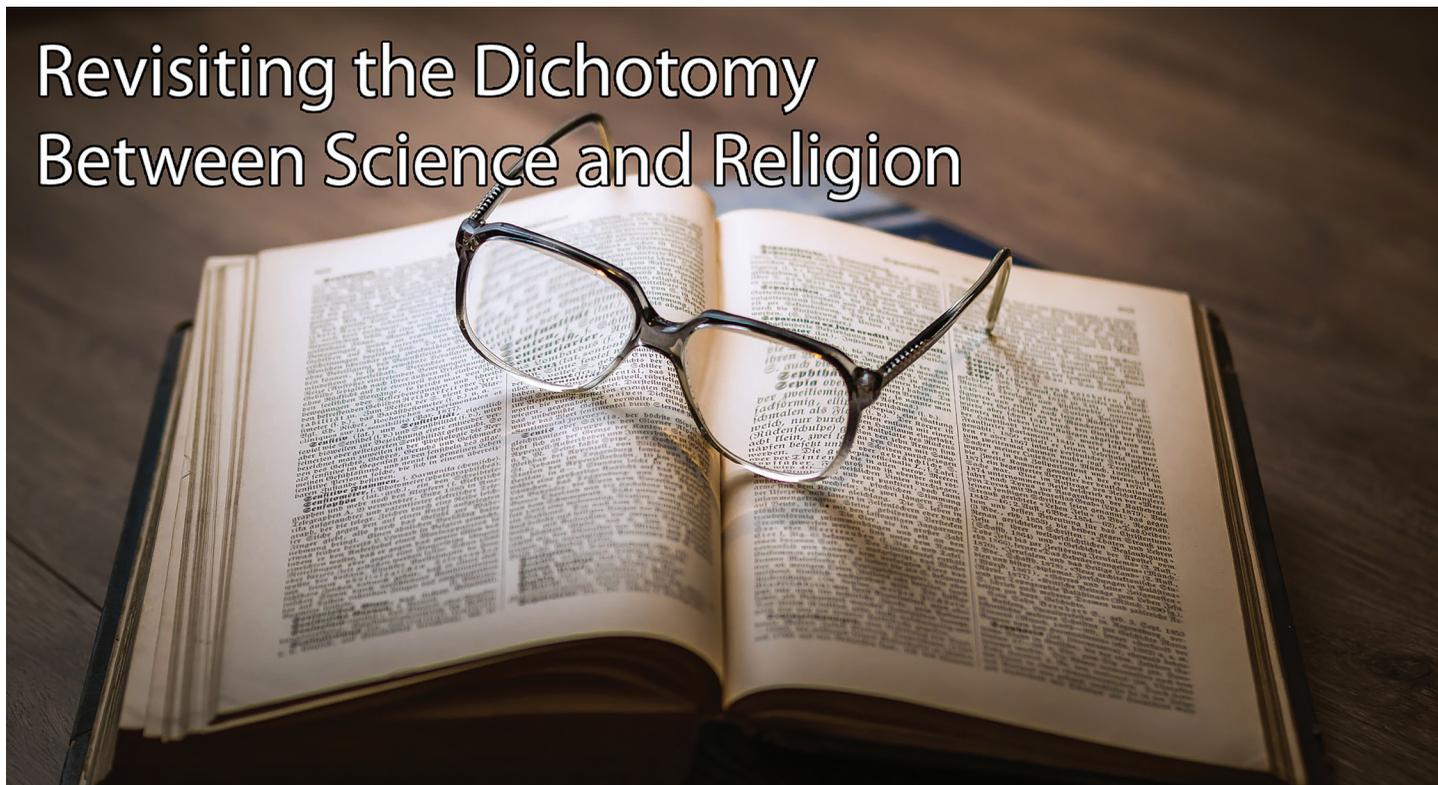
AK: Finally, before we end, we’ve also heard that you will be taking on a few very exciting roles this upcoming year!

DL: Yes, there are two big things that are coming up that are future challenges, and I’m already gearing up for both of them in various ways. The first is being co-Faculty Dean of Lowell House, and I’ll be doing that with my spouse Nina [Zipser] who’s the Dean of Faculty Affairs and Planning. After hanging around Lowell for the past nine months, I’ve seen that the level of energy and warmth and support is extraordinary, and I’m realizing that this is a really lucky opportunity to join this community as a faculty dean and be part of this loving and supportive and diverse and exciting multiverse.

The other big thing that I'm taking on now, which is also a very exciting challenge, is teaching Ec 10 starting in the fall with a wonderful colleague named Jason Furman. Jason is a professor in the Kennedy School and is not only a great economist, but has also had an extraordinary amount of experience in a policy role in Washington. I'm really excited to be taking on the Ec 10 position and working together with him. He brings a lot of real-world knowledge to the table, and I think we're both prone to seeing the world through a similar lens, which is one that emphasizes the use of data and also the modesty that economists need to have about our understanding of the world. We are excited by the challenge of communicating simultaneously all the fascinating things that we've learned in our careers both as academic and policy economists, but also exploring all the big holes in our knowledge and the discipline of economics. We want to emphasize the need for new research and new policy to better understand the world and also address the many challenges that our society faces, including rising inequality and many other social ills that in many ways threaten the health of our society. I'm eager to see the next generation of economists will rise to that challenge, some of whom will hopefully come through our course.

This interview was edited for clarity.

Revisiting the Dichotomy Between Science and Religion



Amma Ababio '19

In 1769, Benjamin Rush, a physician, began his forty-four-year career as a physician and humanitarian in Philadelphia by opening his medical practice¹. During his first years of practice, many asked him if he was a “Doctor of Divinity or Physic.”² For him, however, there was no division between medicine and religion; he thought of himself as a Christian-Doctor³. He devoted much of his early practice to treating sick paupers who were neglected by the larger Philadelphian medical community. In his autobiography, Rush reflected upon his services to these paupers with “heartfelt pleasure.”⁴ He wrote that he only hoped that God would accept his “services to His poor children” and that he would receive the “divine promises to such acts of duty” to his fellow creatures⁵. The knowledge he gained fulfilling his divine duty to his fellow creatures formed the basis of his famous and infamous

1. Although Benjamin Rush was integral to the development of psychiatry in America, the title “Father of Psychiatry” is disingenuous to the many others who devoted their careers to improving the care and treatment of insane people in America.

2. Benjamin Rush, *The Autobiography of Benjamin Rush*, ed. George Corner, (Princeton: Princeton University Press, 1948), 79. A doctor of physic was a medical doctor and a Doctor of Divinity was a theologian.

3. Ibid.

4. Ibid., 84.

5. Ibid.

theories and treatments for mental illness that many scholars have used to justify his title as the “Father of American Psychiatry.”⁶

The history of the development of psychiatry in America provides a unique opportunity to explore the relationships between science, medicine, and religion in the early years of the American republic. The work of Rush and others such as Thomas Kirkbride who were integral to the development of psychiatry in America was informed by a pious duty to help mentally ill people. Even though the importance of this duty is found throughout their work, scholars, especially historians of medicine and science, have not critically engaged with the influence of religion on the development of psychiatry in America.

The historiography of the history of psychiatry in America is primarily a history of the establishment of mental hospitals. Early generations of historians such as Albert Deutsch saw the emergence of these mental hospitals as the pinnacle of benevolent, rational, and enlightened medicine. In Deutsch’s broad survey, *The Mentally Ill in America: A History of Their Care and Treatment From Colonial Times* (1937 and 1949), he wrote within the “Wig” or Progressive tradition which presented the establishment of mental hospitals as a triumph over the “punishment, repression, and indifference” that categorized provisions for mentally ill people before the

6. Ibid.

mid-eighteenth century.⁷ The career of Benjamin Rush at the Pennsylvania Hospital, the first hospital in the British North American colonies, was Deutsch's shining example of the progression of reforms to the care and treatment of mentally ill people in America. Deutsch attributed these reforms to the "rational humanitarianism" of "enlightened" Americans such as Rush.⁸ He used religion as a contrast to medicine. He praised enlightened eighteenth-century physicians for liberating mentally ill people from the dark ages of "primitive man peoples" using "talismans," "amulets," "incantation," and "prayer" to treat mental illness.⁹

"[The] history of psychiatry in America is primarily a history of the establishment of mental hospitals."

Scholars in the 1960s and 1970s were more critical of the establishment of mental hospitals in Europe and America in the nineteenth century. They generally argued that the wealthy and powerful established these hospitals as a means of social control. Michel Foucault offered the most radical critique of the establishment of mental hospitals. In Foucault's *Madness and Civilization: A History of Insanity in the Age of Reason* (1961), he argued that the institutionalization of mentally ill people in Europe was not an effort to liberate mentally ill people from their shackles, but rather to bring them under the control of reason. Specifically, proponents of mental hospital reform in Europe such as William Tuke, in Foucault's view, used fear to compel mentally ill people to internalize their previous external chains and adhere to a form of Christian morality.¹⁰

In America, David Rothman approached the "birth of the asylum" from the standpoint of a sociologist.¹¹ In *The Discovery of the Asylum: Social Order and Disorder in the*

New Republic (1971), Rothman rejected the premise that the founders of mental hospitals in America established them out of Christian benevolence. He argued that the establishment of mental hospitals in the Jacksonian era was "an effort to insure the cohesion of the community in new and changing circumstances" by socially controlling "deviant and dependent" groups such as paupers and the mentally ill.¹² Furthermore, he argued that the purposes of these mental hospitals were to reform "deviant" and "dependent" groups to "exemplify the proper principles of social organization and thus insure the safety of the republic and promote its glory."¹³ Foucault and Rothman formed the "social control" school of the historiography of the history of psychiatry.

Subsequent generations of scholars did not fit within the Whig or social control schools.¹⁴ In *Mental Institutions in America* (1973), Gerald Grob analyzed the complex interactions between the professional goals of early psychiatrists, (Christian) humanitarianism, the social welfare system, and conditions within mental hospitals to present a survey of mental health policies from the colonial period to 1875.¹⁵ Nancy Tomes wrote her influential book *The Art of Asylum-Keeping: Thomas Story Kirkbride and the Origins of American Psychiatry* (1984) during a critical period of scholarly discussions about the origins of psychiatry in America. At the center of these discussions was the polarized image of the nineteenth-century mental hospital as either a "medical institution infused with humanitarian values," or as "a prison-like structure dedicated solely to confinement."¹⁶ She realized that despite the heated debate, scholars ignored how these hospitals functioned as social or medical institutions. Tomes attempted to reconstruct the social history of the Pennsylvania Hospital for the Insane and the origins of psychiatry in America by examining the life and career of Thomas Story Kirkbride, the first superintendent of the Pennsylvania Hospital for the Insane. Tomes and Grob hoped that their work would bring a more balanced narrative about the development of psychiatry in America in

7. Albert Deutsch, *The Mentally Ill in America: A History of Their Care and Treatment from Colonial Times*, (New York: Columbia University Press, 1949), 39.

8. *Ibid.*, 55.

9. *Ibid.*, 1-2.

10. In *Madness and Civilization*, Foucault mainly dismissed the benevolence of William Tuke in the establishment of the York Retreat, an insane hospital in York, England.

11. David Rothman, *The Discovery of the Asylum: Social Order and Disorder in the New Republic*, (Boston: Little, Brown and Company, 1971), xviii.

12. *Ibid.* The exact dates of the Jacksonian Era are elusive. Andrew Jackson was president from 1829 to 1837, but some scholars argue that he influenced politics in America before and after his presidency.

13. *Ibid.*, xix.

14. Nancy Tomes, *The Art of Asylum Keeping, Thomas Story Kirkbride and the Origins of American Psychiatry*, (Philadelphia: University of Pennsylvania Press, 1984), 9.

15. *Ibid.* Grob's *Mental Institutions in America* is largely regarded as one of the most comprehensive surveys of the development of psychiatry in America.

16. *Ibid.*, xxix.

the nineteenth century. However, they devoted relatively little attention to the religious and ideological origins of American psychiatry.

The traditional dichotomy between secular science and religion did not exist in the early years of the American republic. In the mid-eighteenth and early nineteenth centuries, science, medicine, and religion sat at in an uneasy alliance. A recent analysis of the religious convictions and practices of the proponents of the Pennsylvania Hospital, Friends Hospital, and the Pennsylvania Hospital for the Insane, three important hospitals in the development of psychiatry in America, showed that religion was an important motivator for these proponents and integral to the development of psychiatry. The complex histories of these hospitals and our understandings of the development of psychiatry in America are incomplete if scholars do not critically engage with the influence of religion.



Solving the Protein Folding Problem: AlphaFold's AI Approach

Andrea Rivera '22

Introduction

Artificial Intelligence (AI) is a currently innovative field that has completely changed the way research in the life sciences is approached in the 21st century. Numerous areas have improved exponentially in just a few years, with one of the most important contributions being towards solving the protein folding problem. One of the biggest mysteries in the life sciences to date is predicting how proteins fold in a three-dimensional space. This question is particularly complex because it is dependent on various components, among these the folding mechanism and the sequence of amino acids. However, understanding how proteins fold is extremely important, because a protein's structure plays a major role in determining its function.

One of the biggest mysteries in the life sciences to date is predicting how proteins fold in a three-dimensional space.

The potential implications of accurately predicting how a protein folds include recognizing a protein's function by simply reading its amino acid sequence and accelerating drug discovery by generating faster and cheaper

computer simulations of proteins.¹ A Google-affiliated AI research lab called DeepMind recently developed a software program, AlphaFold, that is currently making major breakthroughs in accurately predicting three-dimensional protein structures. This piece will focus on examining AlphaFold's approach towards solving protein structures and our current knowledge and gaps in this field.

Protein Folding: What We Know

The notion of the protein folding "problem" was first identified in the 1960s, when the first atomic-resolution protein structures emerged.¹ Since then, scientists have identified three main areas of research regarding this problem: discovering the interatomic forces that determine the structure of a protein, understanding how the amino acid sequence relates to this structure, and outlining the physical pathways through which a protein folds.¹ Although many advances have been made towards understanding these three components, they are heavily interdependent, and there is no clear way to separate them. This makes it extremely hard to determine to what extent each interaction plays a role in the folding process. While the dominant driving force for protein folding is considered to be the hydrophobic interactions between amino acid side chains, none of these components should be neglected, and they should all be accounted for in simulations of protein folding.

Deepmind's AlphaFold

Predicting how proteins will fold has become such a major area of research that scientists from all over the world now come together for a bi-annual Critical Assessment of Structure Prediction (CASP) competition, where they try to predict the three-dimensional structures of specific proteins. In 2018, a Google-affiliated AI research lab called DeepMind showed that artificial intelligence could potentially solve the protein folding problem once and for all. DeepMind's AlphaFold software program won the competition by correctly predicting how 25 out of the 43 proteins in the competition would fold.⁴ Although this accomplishment might not seem impressive, the runner-up for the competition was only able to correctly predict 3 out of the 43 proteins.⁴

Approach

AlphaFold's approach to protein solving was innovative. Unlike previous approaches, it modeled the proteins without using previously known protein structures as templates. AlphaFold first focused on achieving a high degree of accuracy in predicting the physical properties of the protein structure and then used that information to predict full protein structures by using two different methods.² Both of these methods used deep neural networks trained to predict properties of the protein from the amino acid sequence, including the distances and the angles between the bonds of the amino acids.² The first method estimated the distance between amino acid pairs by training the neural network to predict separate distributions of distances between every pair of residues in a protein. These probabilities were later combined into a score that estimated how accurate a proposed protein structure is.² In addition, they trained a separate neural network that used all the distances previously approximated to calculate how close the proposed protein structure was to the correct one.² In order to improve the prediction of the proteins, they trained a generative neural network to invent new protein fragments, which helped improve the score of the proposed structures. Figure 1 summarizes three of the protein structures predicted by DeepMind's AlphaFold (T0954/6CVZ, T0965/6D2V, T0955/5W9F) through the first method. The structures are represented as heat maps of the distances between residues. The correct protein structures are shown in green and AlphaFold's prediction in blue.

The second method optimized the scores by applying gradient descent, a mathematical technique used to

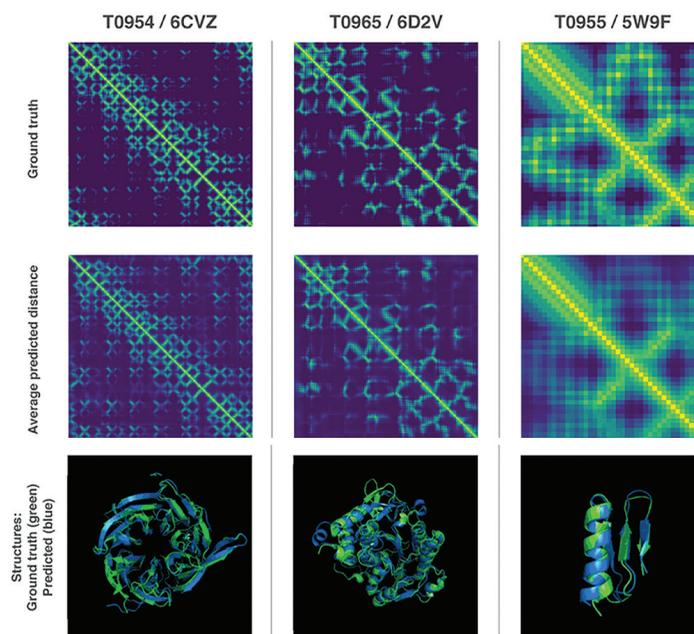


Figure 1: Average predicted distance versus the ground truth for the T0954/6CVZ, T0965/6D2V, and T0955/5W9F proteins by the AlphaFold system.²

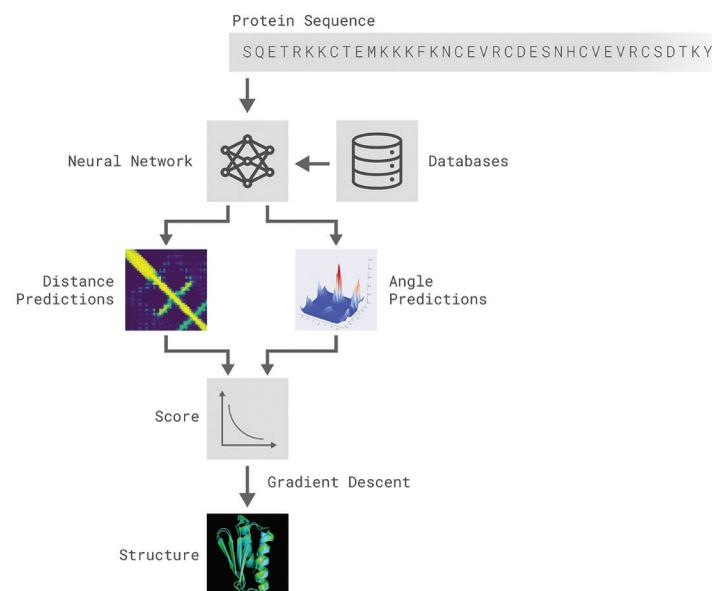


Figure 2: AlphaFold's method of optimizing scores by using gradient descent.²

make small but incremental improvements to the score, to entire chains of proteins in order to reduce the complexity.² This method is modeled in Figure 2.

Applications

Alpha Fold's ability to more accurately predict a protein's structure is an important step in our understanding of proteins and their roles in the human body. There are

infinite applications of predicting protein structure in many fields, especially in medicine. These visualizations could be extremely valuable for diagnosing and treating diseases that are believed to be caused by misfolded proteins, including Alzheimer's, Parkinson's, and Huntington's disease.² It would be possible to use simulations and models to increase our knowledge of these diseases and possibly discover new drugs and treatments while reducing research costs. What at first appears to be a small step in solving this complex problem is actually a great advance in many research fields. With the help of Artificial Intelligence, the seemingly distant possibility of curing diseases like Alzheimer's and Parkinson's and developing new drugs could one day become a reality.

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Apurva Kanneganti '20

Professor Colleen Cavanaugh is the Edward C. Jeffrey Professor of Biology in Harvard's Organismic and Evolutionary Biology Department and one of the founding members of the Microbial Sciences Initiative. Renowned for her work on chemosynthetic bacteria and the microbial landscape of deep sea hydrothermal vents, Professor Cavanaugh has taught, advised, and guided many budding scientists during her years at Harvard. THURJ writer Apurva Kanneganti sat down with Professor Cavanaugh to discuss her research and teaching career and experiences at Harvard.

AK: Thank you so much for giving us this opportunity! Would you be able to give us a quick overview of your academic career thus far?

CC: I grew up in Detroit and went to the University of Michigan for my bachelors. The summer after my sophomore year, I took a Michigan marine ecology course that was offered in Woods Hole [MA], and that's how I learned that undergraduates could even do research. It was a six-week-long course, where we had two weeks of classes and then four weeks to design, carry out, write up and report on a specific research project. I had never done anything like that before. I had written a term paper previously for an oceanography class on horseshoe crabs, and that's what I ended up doing my project on. Next, I went on to do an NSF URP [now an NSF REU] in a neurobiology lab where I worked on a project involving larval horseshoe crabs.

By that point, I had fallen in love with Woods Hole, research, and the scientific community there. When I graduated from Michigan, I ended up coming back to take a January course. I became a fellow and then a technician at the Ecosystem Center there. By that time however, I had had so many unique research experiences that I was determined to do better. I applied to graduate schools, and I ended up going to Harvard, studying in the department of Organismic and Evolutionary Biology.

AK: How did you ultimately decide what aspects of biology you wanted to study?

CC: My first year taking classes in graduate school, I was freaking out about what was I going to do my thesis on and how was I supposed to come up with any ideas. Luckily, I was taking a graduate course on the nature and regulation of marine ecosystems, where we had a series of talks on thriving animal communities at deep sea hydrothermal vents, ecosystems where bacterial chemosynthesis fueled by chemicals such as hydrogen sulfide serves as the base of the food chain. One of the talks was by Meredith Jones from the Smithsonian Institution who worked on the anatomy of these giant tubeworms, finding that they had no mouth and no gut, so how did they eat? He mentioned he found crystals of elemental silver in their tissues, and that's where I jumped up and said they must have chemosynthetic bacteria inside their bodies, feeding them internally in a symbiosis like algae with corals, only using sulfur instead of

sunlight as an energy source. He disagreed, mentioning a potential detoxification role instead, and I said that these symbionts would be able to do that as well. Ultimately, he sent me tissue, and, after a tortuous process, I was able to confirm my ideas, and published my findings in *Science* along with five other papers on the vents and the animal communities. After that, I and colleagues around the world discovered that chemosynthetic symbioses are widespread in nature, occurring with many different invertebrates and protists in the deep sea as well as shallow marine sediments like mudflats where there is lots of hydrogen sulfide (that rotten egg smell).

After graduate school, I completed a postdoc in the Netherlands and a junior fellowship here at Harvard, where I was able to work with Professors Woody Hastings, Lawrence Bogorad, and Wally Gilbert, learning many different molecular biology and enzymology techniques that I could apply to my work on chemosynthesis. After that point, I became an assistant professor, and I've been here ever since!

“I think it is a valuable experience for any researcher to have, even those who ultimately end up focusing on lab work!”

AK: What does your lab work on currently?

CC: We're still studying chemosynthetic symbiosis but have branched out into other aspects of symbiosis, ranging from the gut microbiome of Darwin's finches to the human oral microbiome. I also have a postdoc examining the intracellular bacteria found in protists (including *Legionella*), along with a project describing a potential “new” Calvin cycle in chemosynthetic symbionts.

AK: During your time at Harvard thus far, what classes have you taught, and what would you like to teach in the future?

CC: For years, my main undergraduate class was a lecture, lab, and discussion course on symbiosis, which was essentially a course on biodiversity as well as symbiosis. Later on, I taught graduate seminars on bacterial diversity, symbiosis, and microbial ecology. I started teaching a freshman seminar five years back that built off my symbiosis class, but it's distinct. We do labs and field trips, where I take the students to the aquarium to study corals and photosynthetic symbionts, have them dig up clover in Harvard Yard to study legumes, and travel to the Boston Harbor islands and the Harvard Herbaria to examine lichens. I also teach my undergrad/graduate seminar on topics in symbiosis. In terms of the future, I would like to go back to microbial diversity, incorporating elements of genomics, metabolism, and biochemistry along with ecology and evolution. Also, if possible, I think I'd also like to teach a course that has a substantial fieldwork component to it; I know so many people in science

who discovered their passion for research by doing fieldwork, and I think it is a valuable experience for any researcher to have, even those who ultimately end up focusing on lab work!

AK: On campus, we know that you are a core member of the Microbial Sciences Initiative (MSI), just stepping down as Co-Director after 17 years. Could you elaborate on what MSI does and how that community came about?

CC: When I was hired by my department, I was the only microbiologist, and we didn't end up hiring another one for nearly 15 years. A lot of the departments here are similar, with only one or two, maybe three, microbial scientists at any given time. MSI started when Rich Losick (MCB), who studies the developmental biology of bacteria, Dan Schrag (EPS) who works on Earth history and climate change, and I were all in Harvard Yard for a meeting. As we were headed back to our offices, the three of us realized that, despite working so close to one another (Rich and I are in the same building!), we rarely saw each other. We started having coffee and breakfast sessions and slowly starting bringing in other microbiologists as well, and that's where the idea for MSI came about.

The founding principle behind MSI was to bring people currently conducting or interested in microbial science together so that they could interact and learn from one another. Since a lot of us came from different fields and departments, however, we needed to make sure we had a common language to communicate with. That's how we started having chalk talks – no slides, no long equations or derivations – as our primary form of presentation. With support from the Provost's office, we then gradually built up to inviting people outside of Harvard for a monthly seminar, and instituted a yearly MSI Symposium (we just had our 16th this year).

MSI changed my life at Harvard because it draws so many interesting and fabulous people together from so many microbial research areas. I see my colleagues from multiple departments at Harvard both on this side of the river and from the medical area and students and postdocs from many different labs, with people attending our events from all over Boston and New England. Numerous collaborations have evolved from MSI and being able to help create and sustain such an exciting microbial community was genuinely an amazing

“ I would like to go back to microbial diversity, incorporating elements of genomics, metabolism, and biochemistry along with ecology and evolution. ”

experience.

AK: In what additional ways do you think being at Harvard specifically has helped your research?

CC: The students are fabulous. The undergraduates are really amazing and keep us on our toes, and being able to attract and work with excellent graduate students has also been incredible.

AK: Finally, do you have any tips or advice for students looking to get involved in research?

CC: Of course! When you are first starting to look for labs you might want to join, I think it's important to really take a closer look at the work the professors are doing, judge whether that is interesting to you personally, and read their papers in enough depth that you have a basic understanding of the topic. After that, I would suggest you email or even call the PI to discuss potential positions and then go and actually visit the lab in person. Additionally, I would also really encourage students to seek out summer fellowships or research experiences and travel to new and exciting places to conduct research as well!

This interview was edited for length and clarity.

