

Spring 2021
Vol. 13, Issue 2

thurj

HOW FEMALE UNIONS IN THE EARLY 20TH CENTURY

**Charted an Immigration-Friendly
Path for the American Labor
Movement**

**Red, White, Black and Blue:
The Problem of Symbolizing
America**

**Choice Amnesia: When
Difficult Product Choices are
Harder to Remember**

**One Man, Three Histories:
An Analysis of the Impact of
Presentist Histories on 19th
Century Vaccination Debates**



Congratulations to
Jonah
Satchel Berger
for winning
Best Manuscript

Jonah Satchel Berger, a native of Pittsburgh, Pennsylvania, is a senior in Cabot House concentrating in Economics with a secondary in History. As an undergraduate research associate at the Center for History and Economics, he has extensively studied the immigration politics of late 19th- and early 20th-century labor unions, including researching labor's role in the passage of the 1882 Chinese Exclusion Act and in the Mexican-American Repatriation of the 1930s. His interest in labor unions stems in part from his hometown's legacy as a hub of union organizing and labor uprisings. Currently, Jonah writes an opinion column for the Harvard Crimson, where he was previously a metro news editor. He also served as a team leader for MIHNUET, a student-led public service organization that offers music performances at local elder-care facilities. He enjoys running and watching baseball in his free time.

May 2021

Dear Harvard Community,

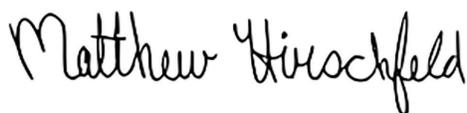
We are delighted to present the Spring 2021 issue of The Harvard Undergraduate Research Journal (THURJ), Harvard's sole peer-reviewed student-run biannual publication dedicated to showcasing outstanding research from the Harvard undergraduate community. For over fourteen years, we have been proud to publish high-quality, original research from a wide range of disciplines. In light of this year's particularly difficult circumstances, we are proud of the tremendous work, collaboration, and commitment that THURJ members have put into making this electronic issue possible. In this issue, our authors explore topics as far-ranging as an art-history analysis of the role of the American Flag in African American communities during the Vietnam War, to a labor-economics study that draws connections between the early 20th-century female labor movement and today's immigration debates.

Every year, we work to increase THURJ's visibility in the Harvard community and strengthen our reputation as a peer-reviewed journal. This semester, despite being physically separated from one another, we are proud to have continued to recruit new members to our organization and to have solidified long-term future leaders of THURJ. We hope that they are empowered to continue promoting scholarly research on campus. 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 undergraduate institutions. In particular, we have continued to work with and advise undergraduates from Georgetown and Yale, and have initiated a new ongoing relationship with students at Cornell, helping them spearhead the development of 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 pay sincere and profound tribute, and to extend our deepest, infinite gratitude to our long-time faculty advisor, Professor Guido Guidotti, who recently passed away. His legacy will always live on through THURJ. Lastly, 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,



Matthew Hirschfeld
Co-Editor-in-Chief



Sreekar Mantena
Co-Editor-in-Chief

Submit your research to

thurj

The Harvard Undergraduate Research Journal

THURJ is the *only* campus publication that showcases peer-reviewed *undergraduate* student research.

Circulation to dorms, departments, libraries, and scientific institutions.

Submit your research, manuscript or thesis!

Email contact@thurj.org for submission guidelines.

THURJ accepts submissions that reflect original research in all disciplines!*

\$500 for Top Manuscript!

For more info, including our latest issues, email contact@thurj.org

*Including the formal sciences, natural sciences, applied sciences, engineering, social sciences, and humanities.

Contents

Research

11 Red, White, Black and Blue: The Problem of Symbolizing America

Maeve Miller

26 Choice Amnesia: When difficult product choices are harder to remember

Julia S. Friedman

18 How Female Unions in the Early 20th Century Charted a Immigration-Friendly Path for the American Labor Movement

Anna Giannuzzi

35 One Man, Three Histories: An Analysis of the Impact of Presentist Histories on 19th Century Vaccination Debates

Rosie Poling

Features

45 Interactive teaching techniques: an interview with Professor Eric Mazur

Andrea Rivera

54 Developing Novel Therapeutics for Systemic Lupus Erythematosus Through the Analysis of Gender, Race, and Ethnicity components

Dianelis Lopez

49 Discovering ourselves with EEG

Serena Zhao

Executive Board

Managing Editor of Peer Review

William Ho '21

Managing Editor of Content

Andrea Rivera '22

Co-Editors-in-Chief

Matthew Hirschfeld '21

Sreekar Mantena '22

Managing Editor of Design

Daniel Mendoza '21

Business Manager

Sreekar Mantena '22

Board

Peer Review

Associate Editors

Brandon Gong '22

Edward Lee '22

Catherine Gallori '23

Seo-Hyun Yoo '23

David Aley '24

Jai Khurana '24

Peer Reviewers

Mythri Ambatipudi '22

Michael Kielstra '22

Peer Reviewers

Yuen Ting Chow '23

Simon Levien '23

Jailene Ramos '24

Josh Josephy-Zack '24

Serena Zhao '24

Design

Associate Editor

Ruba Emran '24

Designers

Catherine Gallori '23

Content

Associate Editors and Writers

Dianalis Lopez '22

Andrea Rivera '22

Serena Zhao '24

Faculty Reviewers

Michael Bronski

Professor of the Practice in Activism and Media in Studies of Women, Gender and Sexuality, Harvard Faculty of Arts and Sciences

Jannis Jizhou Chen

PhD. Candidate, Harvard East Asian Languages and Civilizations

Lizabeth Cohen, MA, PhD.

Harvard University Distinguished Service Professor, Howard Mumford Jones Professor of American Studies, Harvard Faculty of Arts and Sciences

Alex Csiszar, PhD.

Professor of the History of Science, Harvard Faculty of Arts and Sciences

Karen Flood, PhD.

Associate Dean for Academic Affairs, Harvard Summer School

Nicolas Guida-Johnson

PhD. Candidate in Economics at Boston University

Jane Kamensky, MA, PhD.

John Trumbull Professor of American History, Harvard Faculty of Arts and Sciences; Scheslinger Library, Radcliffe

Daniel Koss, PhD.

Research Scholar and Lecturer in East Asian Languages and Civilizations, Harvard Faculty of Arts and Sciences

Joscha Legewie, Ph.D. Assistant Professor of Sociology, Harvard University Department of Sociology

Max Krasnow, PhD.

Associate Professor of Psychology, Harvard Faculty of Arts and Sciences

Tian Li, PhD.

Lecturer & Postdoctoral Fellow, Harvard East Asian Languages and Civilizations, Korea Institute

Caroline Light, PhD.

Senior Lecturer on Studies of Women, Gender, and Sexuality, Harvard Faculty of Arts and Sciences

Hannah Marcus, PhD.

Assistant Professor of the History of Science, Harvard Faculty of Arts and Sciences

Scott Podolsky, MD.

Professor of Global Health and Social Medicine, Harvard Medical School

Ricardo Rodriguez-Padilla

PhD. Candidate, Economics, Harvard University

Dylan Suher, PhD.

Postdoctoral Fellow, Society of Fellows in the Humanities, University of Hong Kong

Michael Szonyi, D. Phil

Frank Wen-hsiung Wu Professor of Chinese History, Harvard Faculty of Arts and Sciences

Shao-Hung Teng

PhD. Candidate, Harvard East Asian Languages and Civilizations

Xiaofei Tian, MA, PhD.

Professor of Chinese Literature, Harvard Faculty of Arts and Sciences

Laurel Thatcher Ulrich, MA, PhD.

300th Anniversary University Professor Emerita, Harvard Faculty of Arts and Sciences

Faculty Advisory Board

Alán Aspuru-Guzik, Ph.D.
Professor of Chemistry & Chemical Biology

Paul Bamberg, Ph.D.
Senior Lecturer in Mathematics

Michael Brenner, Ph.D.
Glover Professor of Applied Mathematics & Applied Physics

Myron Essex, D.V.M., Ph.D.
Mary Woodward Lasker Professor of Health Sciences

Brian Farrell, Ph.D.
Professor of Biology

Jeffrey Flier, M.D.
Dean, Harvard Medical School & George C. Resiman Professor of Medicine

Steven Freedman, M.D., Ph.D.
Chief of the Division of Translational Research & Professor of Medicine, Harvard Medical School

Guido Guidotti, Ph.D.
Higgins Professor of Biochemistry

David Haig, Ph.D.
George Putnam Professor of Organismic & Evolutionary Biology

Dudley Herschbach, Ph.D.
Frank B. Baird Jr. Research Professor of Science

John Hutchinson, Ph.D.
Abbot & James Lawrence Professor of Engineering & Gordon McKay Professor of Applied Mechanics

Efthimios Kaxiras, Ph.D.
John Hasbrouck Van Vleck Professor of Pure & Applied Physics

George Lauder, Ph.D.
Professor of Biology & Alexander Agassiz Professor of Zoology

Richard Losick, Ph.D.
Maria Moors Cabot Professor of Biology

Lakshminarayanan Mahadevan, Ph.D.
Lola England Professor of Applied Mathematics, Professor of Organismic and Evolutionary Biology & Professor of Physics

David Mooney, Ph.D.
Robert P. Pinkas Family Professor of Bioengineering

Hongkun Park, Ph.D.
Professor of Chemistry & Physics

Steven Pinker, Ph.D.
Johnstone Family Professor of Psychology

Tobias Ritter, Ph.D.
Associate Professor of Chemistry & Chemical Biology

Eugene Shakhnovich, Ph.D.
Professor of Chemistry & Chemical Biology

Irwin Shapiro, Ph.D.
Timken University Professor

Zhigang Suo, Ph.D.
Allen E. & Marilyn M. Puckett Professor of Mechanics & Materials

David Weitz, Ph.D.
Mallinckrodt Professor of Physics & Applied Physics

Contact

General: contact@thurj.org
Advertising: advertising@thurj.org
Subscribing: subscriptions@thurj.org
Submissions: submissions@thurj.org

Copyright © 2021 The Harvard Undergraduate Research Journal

We abide by the Creative Commons BY-NC-ND 3.0 license. Commercial uses and derivative works are prohibited. Material appearing in this publication may be redistributed providing that articles in their entirety are reproduced. Rights of photographs may only be granted by the photographer. The opinions expressed in this magazine are those of the contributors and are not necessarily shared by the editors. All editorial rights are reserved.

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 an image of a group of women working in a more modern factory setting reminiscent of one that may have been covered by the International Ladies' Garment Workers' Union. Though many unions that arose in the 1920's were hostile towards immigrant workers, this edition's best manuscript, "*How Female Unions in the Early 20th Century Charted an Immigration-Friendly Path for the American Labor Movement*". follows the development of an increasingly progressive women's labor movement.

Image sources: pixabay.com

— 11

**Red, White, Black and Blue: The Problem of
Symbolizing America**
by Maeve Miller '22



This paper explores the American flag and its inability to encompass all of America or Americans. Specifically, the paper looks at the work of African American artists from the Vietnam and post-Vietnam era and their manipulation of the flag form. Through their artwork, artists like David Hammons and Faith Ringgold explore the polyvalent meanings of the American flag. They explore the symbol as harmful and, through such symbolic deconstruction, attempt to undermine America in the process. Such an exploration makes clear that the American flag is charged by the viewer. Artists can use this symbolic charge to destabilize ideas of American values in a productive way, and they did in this era. This paper is particularly relevant because of the rise of new “American” flags such as the blue stripe flag or gay rights American flag in recent years. Ultimately the paper asks a question: can the American flag represent all Americans?



18 —

**How Female Unions in the Early 20th Century
Charted a Immigration-Friendly Path for the
American Labor Movement**
by Jonah Berger '21

The American labor movement's stature today as a bastion of progressive politics can lead us to lose sight of its ruthless xenophobia just a century ago, when it acted as a principal lobbying force for restricting immigration into the U.S. But before the broader movement's political realignment, two unions composed primarily of female workers, the ILGWU and WTUL, charted a valorous path in opposition to this consensus. I offer a deeper look at the two unions' strategies, arguments, and calculations, arriving at three primary conclusions. Firstly, the unions spoke about immigration in a fundamentally different way than did the broader labor movement, framing immigration as an economic boon to all Americans and invoking humanitarian obligations. Secondly, their struggle extended beyond political fights to ameliorating issues specific to their workforces, including sexual exploitation and sexist naturalization laws. Lastly, the women's unions showed a significant blind spot in their refusal to fully accept non-White immigrants. This paper is the first in the literature to highlight the role of female-dominated unions in this era's immigration battles. Their struggle, though marred by internal divisions and constrained by financial and political considerations, provides insight into the labor movement at large in the early 1900s.



26 —

Choice Amnesia: When Difficult Product Choices are Harder to Remember

by Julia S. Friedman '21

I have submitted the manuscript of a social psychology study I conducted this past year. My research examined the impact of decision difficulty on consumers' abilities to remember the decisions they have made. I posed the question: How well do consumers remember the choices they have made, and is memory influenced by the difficulty of the decision? As was hypothesized, my results demonstrate that recall was worse for decisions that, according to a pretest, were more difficult to make. In a follow-up study, I examined whether these results hold when the decisions were among disliked objects, as opposed to liked ones. It is possible that the results from the first study were found only because participants selected the items they liked as opposed to actually remembering which items they had previously chosen. In the follow-up study, included in this manuscript, participants made decisions between pairs of unpleasant items and therefore participants could not simply select the items they liked. As hypothesized, among these disliked pairs, recall was again worse for decisions that were more difficult to make.

— 35

One Man, Three Histories: An Analysis of the Impact of Presentist Histories on 19th Century Vaccination Debates

by Rosie Poling '21



Is history relevant to crafting health policy? Paradoxically, this paper uses history to answer this question. Through a close analysis of three different narratives of “the father of vaccination” Edward Jenner published ninety years after his first vaccination, this paper seeks to understand how historical arguments were relevant to policy debates about compulsory vaccination laws. While all three accounts used similar primary sources, the different interpretations of Jenner as a hero or villain served the authors' arguments about the efficacy and morality of vaccination. These different constructions of Jenner influenced both the Royal Commission's legislation and the public's perception of vaccination, providing insight for current historians on their role during the COVID-19 pandemic.

Research

Red, White, Black and Blue: The Problem of Symbolizing America

Maeve Miller
Harvard College '22

The purpose of this paper was to analyze a particular period in American icon imagery, specifically the use of the American flag in African American art during the Vietnam war. The author tracks the history of flag desecration legislation alongside artworks which utilized the flag in order to give a fuller picture of the discourse around the symbol at the time. This was a period of increase politicization of the symbol abroad and at home. It was also of particular controversy in the African American community where the symbol was decreasingly able to symbolize them and their needs. The author looks specifically at three preeminent artists at the time: Faith Ringgold, Dread Scott, and David Hammons. Each artist reacted to the legacy of the American flag in distinct ways. Faith Ringgold is used to discuss activism around the American flag as a decidedly unredeemable symbol; Dread Scott shows us an example of how art can engage with law in fruitful ways by breaking it; and, finally, David Hammons frames the paper showing us how the flag can be interpreted in a multitude of ways. Ultimately this final assertion reigns supreme: the flag as a polyvalent symbol unable to be defined and thus useless.

The flag is the only truly subversive and revolutionary abstraction one can paint.

- Faith Ringgold (Boime, 18)

The American Flag has long been a contested symbol, abroad and at home. During the Vietnam War Era, however, the subversive quality of the emblem became a significant issue in American politics. While some burned the flag in protest, others sought to protect it in the courts. In both instances, such acts were in response to the multiple – and often conflicting – ideas the flag represented. To one, the symbol was of tyranny and violence while to another it was a patriotic symbol invested in American values like freedom. This controversy resulted in several high-profile court cases which sought to resolve the issue for the first time. Was flag desecration a form of symbolic speech? Was that protected under the first amendment? These questions arose from a public debate in which artists took an outspoken position, pushing the law by ripping, scarring, and redrawing the flag. The flag offered a kind of sacred ground to these artists on which they could debate larger issues. Flag art was invested in questions of censorship, of American values, and of representation itself.

Black artists were trapped at the nexus of these issues at the time. Not only were they engaged with the discourse about citizenship and censorship prompted by the war, but also navigating their place in a post-Civil Rights America. Black people were being sent to fight a war abroad when no one was fighting for them at home, a home of hyper-criminalization of blackness and rampant inequality. Amid a national debate about flag desecration, which spanned roughly from the late '60s until the early '90s, several black artists complicated the flag with their bodies, their colors, and their organizing. For them, the American flag was contested ground on which they might fight for their lives; increased national attention to the symbol only made its manipulation more powerful. Artists like David Hammons, Faith Ringgold, and Dread Scott utilized the flag to explore their critical versions of America, complicating the symbol's claims of unity and neutrality. However, while Ringgold and Scott maintained the symbol's representative ability, using its desecration to symbolically oppose the government, Hammons explored the flag as a symbol charged by an entire nation's history. In

engaging with the flag's constructed nature, Hammons proposes the symbol's deconstruction, ultimately divesting the flag from its significance and making room for a more fluid view of nationhood.

Just as the flag was deconstructed in this period, it was constructed in another. The American Flag sprung out of several years of turmoil surrounding the Revolutionary War. Although it may seem a small point in the larger scheme of nation building, symbols like the flag were, and continue to be, of tremendous importance in constructing collective identity. They encourage unity symbolically, but practically they show one's allegiances and subliminally guarantee loyalty (Boime, 4). David Fischer, writing about the polyvalent nature of the American flag, insists that no other flag "carries such a weight of symbolic meaning" (Fischer, 152). The flag came from an amalgamation of different flags from the revolutionary period, their colors and forms having varying meaning. After several years of inconsistent designs, the Continental Congress passed the first flag resolution in 1777. It read, "the flag of the United States be 13 stripes alternate red and white; that the Union be 13 stars, white in a blue field, representing a new constellation" (Fischer, 162). Unlike the intentionally vague language of this resolution, today the colors and design are generally standardized: red for valor, blue for justice, and white for purity; the stripes recalling the original 13 colonies and the field of stars refers to states. This form is complex, made even more so by the layered associations Americans bring to it beyond those. The first flags after independence were used largely at sea, increasingly becoming synonymous with the protection of American seamen from the bombardment of European fleets (Fischer, 165). From this first example, the flag began to spiral, taking on different meanings at different moments in history. These charges, often contradictory in nature, make the flag an unstable symbol which struggles to meet its goal of uniting a diverse people.

Having survived the 18th and 19th century, the flag entered the 20th. In the early 20th century, many states established laws which protected the flag from misuse. However, by the '50s, these laws had fallen into disrepair from lack of enforcement and the general conception was that the flag was no longer controversial ("The Dispute," 77). For Albert Boime, this shifted with Jasper Johns' *Flag* series which he started in the mid-50s. The series, generally interpreted as an attempt combat blind patriotism with art's susceptibility to

examination, started what Boime terms a “Patriotic Pop” (Boime, 3). This refers to a period of mass consideration of the American flag as a symbol in art. It began alongside the Pop art movement but lasted in various forms through the end of the Civil Rights movement and the Vietnam War. In early 1966, as the Vietnam War raged on, anti-war protesters started burning the flag as a form of “symbolic protest” (“The Dispute,” 78). This caused the first wave of proposals in Congress which sought to protect the flag nationally.

As protests around the country start utilizing the flag in the late ‘60s, David Hammons was just starting out. His body print series, for which he first gain popularity in the late ‘60s and early ‘70s, utilized the American flag over and over. As a series, the prints asked a number of questions about America, about the black (male) body, and about the symbolic. The prints employed a visceral technique: Hammons would grease up his body, lay himself carefully down on a sheet in the desired position, lift up, and finally cover the greased area with black pigment. The resulting prints maintain an indexical relationship to their creator; at once implying Hammons’ presence in their creation, yet forever memorializing his absence (Wofford, 110).



Figure 1: Boy With Flag by David Hammons (1968)

Primary to these prints is the body, specifically the black body. The prints emphasize Hammons’ wide nose and afro-textured hair in inky blacks which contrast a stark white background. In manipulating his body in this way, Hammons subverts a long history of racial science, contorting his body to create forms that are sometimes only passingly identifiable as black. Afterwards, Hammons would often complicate those initial prints, using silk screening to add, for example, the American flag. Importantly, these flag prints did not maintain an indexical relationship to their referent. Instead, they are reduced to the purely symbolic, only gaining significance

in their cultural association for the viewer (Pierce, 102). Contrasted with the body prints which directly relate to a body that exists in reality, the flags lack such grounding. Instead, they recall the flag only in the purest, formal terms.

One such example is *Boy with Flag* (1968) which splits a sheet down the middle: the left half containing the stars and stripes, the right containing a body print (Figure 1). The side-by-side format illicit comparison, begging the question: are these two forms alike or disparate? Purely formally, they could not be more unlike each other on the flat plane. The flag is linear, the alternating red and white stripes evenly spaced. Flipped vertically, the stripes are unmoving like the bars of a jail cell. But, unlike bars, Hammons’ body is not visible behind the flag. Instead, its central line harshly cuts Hammons’ soft form. Behind his outstretched hand, the flag’s red and white push through his “skin,” asserting their brilliance at the deficit of his wholeness. Hammons’ body print is in profile, almost spooning the flag with one hand grasping the stripes. His gesture is mockingly sexual, holding and gazing at the flag just as it unemotionally exists. The positioning emphasizes Hammons’ human faculties while dehumanizing the flag. This recalls a common defense of the flag in Congress, where it was often personified as the living representation American values (for examples see, The Flag Protection Act of 1989).

This revelation of apathy in the flag creates both a compositional and ideological tension between the two forms, due in part to the associations they illicit. For the black print, blackness and the black body are supplementary; for the flag, America and American values. In the relation between these two forms compositionally, there is a representation of unyielding coexistence in the work, a mutually assured segmentation. Despite their differences, the two sides share one thing: neither, it seems, can exist entirely with the other, they are both halved. To read this compositional choice symbolically, it says something about the violent relationship between African-Americans and America. The black body must sacrifice in order to accommodate the flag while the flag, taken to be American values, is put in tension by blackness. In the artist’s own words, “I don’t know whether it’s the black skin against the bright colors or the irony of the flag being held by an oppressed people. I do use the flag to show the contrast between the American Dream and the American Nightmare” (Boime, 21). Here, the American nightmare seems to be the doomed destiny of each form to remain in perpetual tension with the other.

While *Boy with Flag* interrogates the flag’s claim of representing all Americans, *Pray for America* (1969), a later work from the series, interrogates the claim of protection under the flag (Figure 2). The American flag has a long history of symbolic protection primarily during wartime. Hammons is engaged with the long aesthetic tradition of protection using the flag, although he engages with such histories with a dash of irony. Juxtaposing his body with the flag in various poses recalls the protection offered to black bodies by the flag in the past. Specifically, we might compare the case of the formerly-enslaved children of the *Cartes de Visite* from the Civil War. In these photos, distributed by abolitionists to gain white sympathy for their cause, white-passing children are wrapped in or sat beside the flag. As children, their posture and smallness implies a nonthreatening subservience to the flag, and by implication to the American values it represents. Because the flag represented different things to different people, the photos implied the agreement of these children – and by extension the larger slave population



Figure 2: Pray For America by David Hammons (1969)

they represented – to whatever values the viewer held to that flag. According to Mary Niall Mitchell, the photos played off the popular assumption of the innocence of white children as well as reassured the white viewer that the post-antebellum United States “would remain a white nation” (Mitchell, 399).

The charged connection made between the flag and whiteness in these photos is one that Hammons attempts to muddy in his *Pray for America*. In the work, Hammons is wrapped in a flag, reminiscent of postures taken by the children in the *Cartes de Visite* (Figure 3). The major difference here is that Hammons is both a man and a black man at that. His identity complicates the flag in a productive way by subverting the association the American flag has had with whiteness throughout the symbol’s history. The portrait-like oval around the work only further historicizes the piece, referring to portrait photography which gained mass popularity in the Civil War Era. Hammons asks a similar question to that of *Boy with Flag*: does this flag represent and protect a black body like his? Using the same silk-screening technique as *Boy with Flag*, Hammons laid the flag form after his body print, which consists here of only his face and hand. Unlike the other work though, here the flag is fashioned so as to drape over the body like a shawl. The draping implies Hammons’



Figure 3: Our Protection. Rosa, Charley, Rebecca. Slave Children from New Orleans (Mitchell, 400)

body in its curves, although his bottom half is missing. The lack of shadow or gradient in the blocked colors of the screen-print give the flag shawl a decidedly thin, two-dimensional quality. Unlike the massive flags that protect the white-passing children in the *Cartes*, here Hammons’ body is offered little protection. This particular body print is light, giving the face a ghost-like quality. His transparency and stillness implies absence and even death as it contrast with the vibrant colors in the flag. The flag becomes just another empty gesture which actually offers no warmth or protection for the oppressed black body. In his reuse of the flag symbol in this series, Hammons repeatedly shows the disappointments of the flag. Ultimately, the pieces suggest the emptiness of the American flag as a symbol while, at the same time, demonstrating the potency of its associations. The viewer is confronted by the meaning they project onto the symbol while also facing the harsh irony of a black body against the flag’s empty promises.

Such symbolic fascination in the art world with the flag was in part spurred by its popularity in legislature. In 1967, the New York art scene was shaken by the arrest of Stephen Radich, a gallerist in New York. Spurred by popular protest culture, Radich opened

a protest-themed show in 1967 including a work by Marc Morrel which disfigured an American flag. Subsequently, Radich was formally charged for violating a NY flag desecration law and he would be fighting the case for years. This was just one case among many in this period; the Vietnam War Era saw more flag desecration prosecution than in all previous American history (“Prosecutions” 89). In 1968, responding to the plethora of state cases, Congress passed the first ever national flag desecration law: The 1968 Federal Flag Desecration Law.

The law stated:

“(a) Whoever knowingly casts contempt upon any flag of the United States by publicly mutilating, defacing, defiling, burning, or trampling upon it shall be fined not more than \$1,000 or imprisoned for not more than one year, or both.”

The exhaustive language of the law included “any flag, standard, colors, ensign, or any picture representation” of part of or the full flag (“The Dispute,” 80). This was understandably daunting to the arts community and protesters alike. To many protesters, the flag was a symbol of oppression abroad and the contradiction between American values and the war called for the symbol’s removal. For artists, the threat to anyone who “casts contempt” on a symbol rang censorship. Still, some took this law and the arrests under it as a sort of challenge.

For Faith Ringgold, also living in NY at the time, arrests like Radich’s were censorship in the purist terms. Ringgold spent much of her career in the late 60s exploring the flag’s betrayed promises in works like *The Flag Is Bleeding* (1967) and *Flag for the Moon: Die Nigger* (1969). Her approach to the flag added text and figures, but most importantly it favored the manipulation of the symbol which had become suppressed by such government actions (Cotter). Amid the ongoing Radich court case, Ringgold organized The People’s Flag Show at Judson Memorial Church. Beginning November 9th of 1970, the show was marketed as “the people’s answer to the repressive U.S. gov’t & state laws restricting the use & display of the flag” (Figure 4). The only requirement for entry was that a piece in some way included the American flag. This call to action resulted in art from paintings to dance performances. In its survey-like manipulations of the flag, the show primarily raised questions about the legitimacy of the anti-desecration legislature while also opening a debate about the flag itself. The show was shut down a day earlier than planned due to the arrest of the organizers of the show, dubbed the Judson 3: Faith Ringgold, Jean Toche, and Jon Hendricks. They made headlines in New York alongside the Radich case as tensions between the arts and government rose (Glueck, 1970).

Ringgold made a series of prints about the show, including advertisement beforehand. Her prints engage with a larger poster culture at the time, a format often utilized by the Black Arts Movement with which she was associated. Works from this movement drew from non-European imagery and content to create a “black aesthetic” outside of the framework of dominant white culture (Neal, 29). While the poster format had a commercial appeal, it also enabled consumers an avenue to show their political views, such as opposition to the Vietnam War (Ensminger, 17). Ringgold’s *Judson 3* is a prime example of the importance of design aesthetics in community organizing (Figure 4). Created after her arrest, the print conflates popular imagery to contextualize the incident. The design consists of “Judson” written in large, black block letters on top of a flag, with



Figure 4: The People’s Flag Show and Judson 3 by Faith Ringgold (1970) a small “3” in the middle. These letters fill the entire page, their verticality recalling jail bars like those that imprisoned the Three. The flag is reminiscent of the American flag, used here to refer directly to the show at which they were arrested. This reference alongside their assumed group name gives the poster a decidedly political stance which aligns it with the aims of the show and against the censoring government.

The colors chosen here are not without significance. They are the red, green and black utilized in the Pan-African flag first imagined by Marcus Garvey in the early 20th century. Steven Knowlton, in his exploration of Black Nationalist Flags, identifies this flag and its colors as central to the development of black identity in 20th century America. Although he imagines the colors have many origins, he mentions the Rastafarian tradition where red was spilled blood, green was nature, and black was skin color (Knowlton, 39). As they were transformed in African-American discourse, the colors became synonymous with a kind of unity among black people. Here, Ringgold utilizes this aspect of the colors to complicate the American flag. By rendering the flag with this palette, Ringgold aligns the Judson 3 incident with the black struggle; both here are united against the common enemy of the United States government as an oppressive white structure. The text’s prominence as well as the clear manipulation of the flag form directly contradict the enforced



Figure 5: What Is The Proper Way To Display A U.S. Flag? by Dread Scott (1989)

laws for which Ringgold was arrested. In this way, the poster acts as another form of protest by which Ringgold might accentuate the weight of the incident against the size of the forces it opposed, symbolized here by the flag. Further, in framing herself (in the form of the “Judson 3” text) inside the flag, she proposes that protests like hers are a more authentic form of nationalism; she asserts herself as an unlikely patriot who might serve her community by opposing the country’s unjust laws. The work is temporary, its fast, printed technique leaving ink smudges and some unevenness between the letters. However, in its imperfections, the work speaks to its temporal use. This poster exploits the flag’s symbolic associations to communicate an explicit political message in its design. The work does not seek to deconstruct the flag but instead to defame it and, in doing so, question the American values it represents.

The year after the Judson show, Radich was acquitted. His lawyer Richard Green argued that display of a manipulated flag was a form a free expression protected under the first amendment (Boime, 11). Despite the positive result in NY, the Supreme Court had yet to rule on a federal level about the legitimacy Green’s claim. Then, in 1984, Gregory Lee Johnson burned a flag outside the Republic National Convention. He was protesting the reelection of then-president Reagan and was charged under Texas flag desecration laws. The case was heading towards the Supreme Court when Dread Scott presented his *What Is The Proper Way To Display A U.S. Flag?* at the Art Institute of Chicago in 1989 (Figure 5). It was a simple set up: above a cheap Taiwanese-made American flag on the floor was an open notebook for comments and a page-sized photomontage (Schmidt). The photo was split evenly between a picture of flag-draped military coffins and a South Korean student protest. Above the picture, the words “What is the proper way to display a U.S. Flag?” were printed. This question is seemingly innocent, but the images below it give it a decidedly controversial tone. The flag on the ground more readily compared to the coffins, suggesting the death associated with the symbol. However, the protest above problematizes that narrative of heroic death. Soldiers like those in the coffins fought in the Korean War and continued to be a pervasive presence abroad; discontentment with this state of affairs can be read in the sign “Yankee go home son of bitch” which is being held by a faceless protester in the crowd. Cutting across their face and sign is the burning image of the American flag. The images were high-contrast black and white prints, rather than color which would have showed more viscerally the likeness of the flag. The photomontage, alongside the actual

flag in the installation, seems to urge a consideration of the flag as a polysemic symbol with varied uses.

By placing the real flag on the ground, the artist gives prime place to acts of desecrating the flag over the ritual celebration of it. This grounded flag is key in realizing the piece because its presence reminds us that the flag is a tangible commodity as well as a symbol. We as individuals display the flag at certain times or agree to erect it in certain places and this creates a ritualized tradition of nationalism. The flag can be sold, it can be flown, but it can also be stepped on. To comfortably engage with the work (i.e. to write in the notebook as one was invited to do), one had to stand on the American flag. Some did so without a care, other cautiously, and still more refused. As one approached the flag, there was a moment of decision: are you going to step on the flag? Does that step constitute an act of disrespect again America or is it simply shifting onto a new texture of ground? The uncomfortable feeling of stepping on the flag illustrated its iconic, sacred status. Suddenly, stepping on a certain piece of earth made the viewer a target, someone with an opinion, someone who thought it was okay to disrespect the symbol in this manner.

The piece sparked national controversy, igniting ritual protests by Veterans; daily, they would pick up the flag, fold it in military fashion, and place it on the shelf (Schmidt). To Scott, “the super-patriot flag-wavers who marched on the steps of the Art Institute of Chicago were nothing less than a howling white lynch mob who raised the slogan: ‘the flag and the artist – hang them both high’” (Scott, “Speakeasy,” 13). This troubling chant recalls the living nature of the flag in the hearts of many. The artist’s life was to be sacrificed for that of the flag. The notebook, which left space for an open dialogue, got a myriad of supportive and offensive responses. Scott’s piece poignantly provoked a such responses and forced to the surface the underpinning controversy that had become the flag at this moment. It even provoked a response from President Bush who called the work “disgraceful” (Schmidt). Scott’s confrontational piece came mere months before *Texas v. Johnson* ruled, for the first time in the Supreme Court, that flag burning was indeed protected by the first amendment in a close 5-4 decision. The court’s ruling was seen unfavorably in Congress. President Bush publicly called for a constitutional amendment that would override the decision, although that remained undefined (Schmidt). In the meantime, Congress passed the Flag Protection Act of 1989. This made it illegal to destroy the U.S. flag or any likeness of the flag with the exception of proper disposal of a sullied flag. It also expedited any cases relating to flag desecration to the Supreme Court (Committee on the Judiciary).

Scott hadn’t finished with the flag yet. That same year he joined fellow member of the Revolutionary Communist party Gregory Johnson on the steps of the capitol to burn flags. In a triumphant photo, Scott pushes off police as he looks down at the burning flag at his feet (Scott, “What Is”). The incident showed the flag for what it had become: a potent form of dissent. The flag’s mutilation in protest attempted to rupture the bond of loyalty between citizen and nation, indicting the witness with the nation’s many ills. Flag burning was an expression of anger at a nation that refused to see so many and fit readily with the goal of *What Is The Proper Way* in encouraging free symbolic speech and actions. The burning was performed for passersby and press, causing the arrest of Scott, Johnson, and a third man Eichman. This led to one final case, *U.S. v. Eichman* in 1990, in which Scott was a defendant, (Scott, “What Is”). The case

was considered with a very similar case from Washington, U.S. v. Haggerty. Having only just settled *Texas v. Johnson* 5-4, there was a precedent that the court would stand by their decision. However, now the court would need also to consider the constitutionality of the Flag Protection Act. On June 11th, 1990, the Supreme Court sided with Scott, striking down the Flag Protection Act on the grounds that there was no difference between burning a flag to dispose of it and burning a flag in protest. Or rather, that the difference here was based on the intention of the act which would interfere with first amendment right of free expression (“*United States v. Eichman*”). This decision ended the decades of debate on flag desecration, at least in the courts.

It was in the wake of this decision that David Hammons returned to the flag. While other artists like Faith Ringgold and Dread Scott were building a case against the flag, Hammons continued to work on the symbolic. Throughout his career, Hammons has been a symbol breaker. He complicates symbols, typically those in some way associated with representing blackness, by reusing and reconfiguring them over and over. The result of such a project is the symbols – like a spade, a basketball hoop, or a flag – either lose meaning or reveal hidden, more potent ones in their place (Wofford, “Signifying Race”). In 1990, however, he created a new symbol: *African American Flag* (Figure 6). The flag combined the American flag form with the colors of the Pan-African flag to create a new national symbol. Some interesting equivalencies are made in the color switch here. The blue of justice has become the green of nature, suggesting a more fluid and organic way of living which is not so set in the rule of law; the consistent red of blood has in the Pan-African colors a more violent and racial reading; the white for the black is a trade of purity for black skin. In this last equivalency, we might read the equation of white skin with purity, recalling the projected innocence of the children of the *Cartes*.

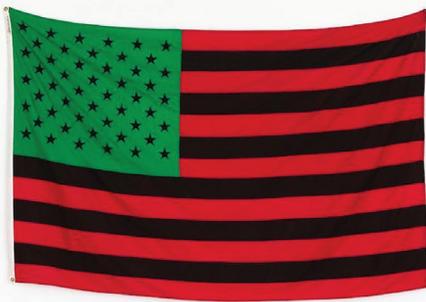


Figure 6: *African American Flag* by David Hammons (1990)

Unlike his body prints, where black body and American flag are separated, here they are brought together. However, the unexpected association of the form and color leaves the work with a dissonance which betrays the unity it proposes. This disagreement makes the piece feel like a color negative, exposing a kind of reciprocal to American values which don't entirely fit. The dissonance of this piece stems from a few places. For one, it is made sour by the irony of its allegedly cohesive message when we know that black people were far from a priority in the U.S.. The whiteness of the flag here is replaced by blackness, suggesting a nation where blackness is

viewed as a neutral framework in which whiteness must configure itself; again, this proposition has a opposite relationship to reality where whiteness is often taken as a neutral framework. Interestingly, though, these new valiances of the flag exist within the unchanged form of the American flag. This consistency suggests an African-American identity that is inextricably tied to American history. The earthy tones of the colors also imply a deeper connection between this form and land. Black identity here is contextualized in the United States, rather than the Pan-African implications of the Garvey flag. This directly contradicts narratives of the African-American as an ungrounded subject who belongs nowhere (Finley, 16). Instead, black identity is grounded in the United States and black people are located historically and spatially in the flag form, implying their continued existence on this land throughout American history.

Hammons made several of these flags, which hung outside museums and his shows in the year after the symbol's creation to “demarcate a black symbolic and geopolitical territory” (Fusco, 47). This authentic use of the flag, in hanging it, gives it a complicated legacy that is both hopeful and harmful. A more hopeful reading shows how the flag imagines a potential new nation, one more conscious of African-Americans (“David Hammons”). This nation and its flag are similarly charged with values that we might imagine include the uplift of the black community in American society or racial equality. For these reasons, the flag has been taken up as a symbol of African Americans and continues to be worn on t-shirts and held at protests. However, might we consider this flag as just another failed national symbol? Knowlton argues that despite championing their specificity as a response to “polysemic national symbols” like the American flag, black nationalist flags of the 20th century ultimately failed to meet that goal. Instead, they were appropriated in popular culture and became charged with varying meanings, to a lesser degree like the American flag itself (Knowlton, 52). Because Hammons remains so conscious of the power of the symbolic, this intention may not be far from his own. The dissonance of the piece visually as well as its dual charge from both American and Black history creates a symbol full of obviously conflicting meanings. In this failed attempt to symbolize America, Hammons' piece ironizes the idea of national symbolism. The flag might propose a new nation onto which we can project our dreams, but we are also confronted with the impossibility of conflating these two ideologies. While blaspheming ideas of national unity in America, however, Hammons continues to engage the potency of the symbol as well as its fraught history for African-Americans.

So, where does this leave us? Today, 30 years after Hammons' intervention, the American flag is just as charged as it was during this period. It continues to be manipulated by both the right and the left precisely because of the malleability of the symbol. Protesters burn the flag at BLM protests to express discontent not dissimilar to that of the Vietnam-Era flag burners; others continue to manipulate the flag form to express their own agendas such as in the Thin Blue Line flag; politicians from presidents and mayoral candidates utilize the flag as a backdrop to their speech, demonstrating their patriotism without explicitly defining what that patriotism means. The incredible variety of the flag's use in contemporary visual culture directly recalls this period in its history. Because of Supreme Court decisions like *Texas v. Johnson* and *U.S. v. Eichman*, we can enjoy the luxury of manipulating the symbol in art and beyond without fear of government censorship.

Artists like Ringgold and Scott demonstrated the effectiveness of the flag as a subversive symbol; their manipulation of the emblem exposed the contradictions of the flag and ultimately of America itself. Alongside these artists, Hammons destabilized the flag, furthering it as contested ground. His continued manipulation of the flag demonstrates its ultimate ineffectiveness as a symbol of national unity. In a new era, could there be a flag, or other symbol, that better represents America? Or, is it possible to move past symbolic unity all together? Freed from such symbolic loyalties, a new nation of individuals might enjoy their diversity outside of the forced unity of national definitions, ultimately opening the door for fuller individual expression outside of such structure.

References

- Benson, Michael. "Art: Studio Museum in Black Art of the 60s." *New York Times*, May 31, 1985. Digital file.
- "The Bill of Rights and National Symbols: Flag Desecration, *People v. Radich*, 257 N.E.2d 30 (1970)." *Washington University Law Review* 1970, no. 4 (January 1970): 517-26.
- Boime, Albert. "Waving the Red Flag and Reconstituting Old Glory." *Smithsonian Studies in American Art* 4, no. 2 (Spring 1990): 3-25. JSTOR.
- Chan, Eugene Y. "Exposure to the American Flag Polarizes Democratic-Republican Ideologies." *British Journal of Social Psychology*, no. 56 (2017): 809-18.
- Collins, Lisa Gail. "Activists Who Yearn for Art That Transforms: Parallels in the Black Arts and Feminist Art Movements in the United States." *Signs* 31, no. 3 (Spring 2006): 717-52. JSTOR.
- Committee on the Judiciary, *The Flag Protection Act of 1989*, S. Rep. No. 101-152, 1st Sess. (Sept. 29, 1989).
- Cotter, Holland. "An Era's Injustices Fuel an Artist's Activist Works." *The New York Times*, December 9, 2010.
- "David Hammons African American Flag." Phillips. <https://www.phillips.com/detail/DAVID-HAMMONS/NY010317/2>.
- "The Dispute during the Vietnam War Era." In *Syracuse University Press*, edited by Robert Justin Goldstein, 77-88. N.p., 1996. HathiTrust.
- Ensminger, David. "Black Light Panthers: The Politics of Fluorescence." *Art in Print* 5, no. 2 (July/August 2015): 16-19. JSTOR.
- Finley, Cheryl. "Introduction: The Practice of Mnemonic Aesthetics." In *Committed to Memory: The Art of the Slave Ship Icon*, 1-17. N.p.: Princeton University Press, 2018.
- Fischer, David Hackett. "Stars and Stripes: A 'New Constellation' of National Liberty and Freedom." In *Liberty and Freedom*, 152-66. N.p.: Oxford University, 2005. HathiTrust.
- . "The Star-Spangled Banner: Francis Scott Key's Vision of 'The Land of the Free.'" In *Liberty and Freedom*, 166-74. N.p.: Oxford University, 2005. HathiTrust.
- "Flag Burning Cases." Video. C-Span. <https://www.c-span.org/video/?12245-1/flag-burning-cases>.
- Fusco, Coco. "Wreaking Havoc on the Signified." In *The Bodies That Were Not Ours*, 44-48. N.p.: Routledge, 2001.
- Gerstenzang, James. "Bush Asks Ban on Flag Desecration: Backs Constitutional Amendment in Wake of Supreme Court Ruling." *Los Angeles Times*, June 28, 1989.
- Glueck, Grace. "Flag-Show Case Aired by Panel." *New York Times*, 1970, 60.
- Golden, Thelma. "My Brother." In *Black Male*, 19-83. N.p.: Whitney Museum, 1994.
- Hammons, David. *Boy with Flag*. 1968. Body print with silk screen.
- . *Pray for America*. 1969. Screenprint and pigment on paper. MoMA.
- Jones, Kellie. "The Structure of Myth and the Potency of Magic." In *David Hammons: Rousing the Rubble*.
- Knowlton, Steven A. "'Show Me the Race or the Nation without a Flag, and I Will Show You a Race of People without Any Pride': The Flags of Black Nationalist Organizations as Disambiguating Responses to Polysemic National Symbols." *Raven* 24 (2017): 27-61. EBSCOhost.
- Mitchell, Mary Niall. "'Rosebloom and Pure White,' or so It Seemed." *American Quarterly* 54, no. 3 (September 2002): 369-410. JSTOR.
- Neal, Larry. "The Black Arts Movement." *The Drama Review* 12, no. 4 (Summer 1968). JSTOR.
- "The Opening of the People's Flag Show (9 November 1970)." 1968 @ 50 (blog). <https://aap68.yale.edu/opening-peoples-flag-show-9-november-1970>.
- Pierce, Charles S. "Logic of Semiotics: The Theory of Signs." In *Philosophical Writings of Pierce*. N.p.: Dover Publications, 1955.
- "Prosecutions in the Lower Courts during the Vietnam War Era." In *Desecrating the American Flag: Key Documents of the Controversy from the Civil War to 1995*, edited by Robert Justin Goldstein, 89-114. HathiTrust.
- Ringgold, Faith. *Judson 3*. 1970. Print. Harvard Art Museums.
- . *People's Flag Show*. 1970. <https://hoodmuseum.dartmouth.edu/news/2013/01/recent-acquisitions-faith-ringgold-peoples-flag-show-1970-and-united-states-attica-1971>.
- Schmidt, William E. "Disputed Exhibit of Flag Is Ended." *The New York Times*, March 17, 1989. <https://www.nytimes.com/1989/03/17/us/disputed-exhibit-of-flag-is-ended.html?sec=&spn=&pagewanted=1>.
- Scott, Dread. "What is the Proper Way to Display a US Flag?" Dread Scott. https://www.dreadscott.net/portfolio_page/what-is-the-proper-way-to-display-a-us-flag/.
- Tyler, Dread Scott. "Speakeasy." *New Art Examiner*, June 1989.
- "United States v. Eichman." Oyez. <https://www.oyez.org/cases/1989/89-1433>.
- Wofford, Tobias. "Signifying Race in David Hammons' Spade Series." In *Can You Dig It?*, 88-135.

How Female Unions in the Early 20th Century Charted an Immigration-Friendly Path for the American Labor Movement

Jonah Berger
Harvard College '21

This paper examines the immigration debate within the labor movement in the early 1900s through the lens of two predominantly-female unions. Using the unions' publications, minutes of their meetings, contemporary news sources, and congressional testimony, I offer a portrait of two unions acting largely alone in their courageous and controversial opposition to the broader labor movement's xenophobia and restrictionism. The women's unions' framing of the issue — as a humanitarian necessity and an economic benefit to American workers — stands in sharp contrast to the American Federation of Labor's attempts to manufacture a divide between its members and vulnerable immigrants. In an era of federal repression of labor activists and an ethos of unrelenting assimilationism, the women's unions also grappled with how to best represent their largely low-income, immigrant membership while maintaining financial viability. Finally, I discuss the divisions within each of the two unions on immigration politics, as well as the female labor movement's blind spot on the issue of non-white immigration.

Introduction

The early 1900s saw the rapid growth and prosperity of multiple predominantly-female labor unions (Wolman, 1924).¹ Two of the largest of these unions at the national level — the International Ladies' Garment Workers' Union and the Women's Trade Union League — counted at least 100,000 members each by 1920, representing a small yet growing contingent within the almost exclusively-male American Federation of Labor (Hearing before Joint Committees, 1920). The unions' gender makeup, though, constituted only one of their many differences with the mainstream labor movement; the female unions were more militantly left-wing, more open to international cooperation, and more willing to oppose the broader AFL's agenda.

The labor movement at large was divided on many issues in the early 1900s, from the merits of socialism to the tactics that unions should employ to combat corporate excess. On immigration policy, though, labor was largely in lockstep, positioning itself not only against bringing foreigners to America's shores but even against treating them with dignity once they arrived. On this issue, the women's unions distinguished themselves. Against the backdrop of rising xenophobia throughout the nation, reflected in and often exacerbated by the labor establishment, these female unions advocated for a liberal and humane immigration policy.

The two unions differed slightly in the extent of their support for immigration and how they framed the issue. While the ILGWU sought a completely free immigration system, the WTUL was more guarded, usually only pushing back against labor's restrictionism but not advocating for a fully borderless country. Both women's unions, though, often fell short in their support for non-white immigrants, specifically those from Asia, instead preferring to focus their efforts on Europeans struggling to survive in the aftermath of World War I. While the motivations of the ILGWU and WTUL differed slightly, together they served as a guiding light for those within the labor movement advocating a more tolerant immigration system.

1. The number of female union members likely grew at their fastest rate in American history in this period, quintupling between 1910 and 1920 from 76,748 to 396,900.

The two women's unions did not only confront the often bad-faith moral and economic arguments of immigration opponents directly; they addressed issues specific to female immigrants, such as high rates of sexual exploitation, a paucity of social services, and laws that favored the naturalization of men over women.

Labor's Position in the Immigration Battles of the Early 1900s

Looking back from a 21st-century perspective, it may be hard to imagine that the labor movement once constituted perhaps the largest and most unified group in American society fighting to limit immigration and foment xenophobia. After all, today's AFL-CIO supports full amnesty for undocumented immigrants and an end to employer sanctions for hiring such workers (Gonyea, 2013). But in the first decades of the 1900s, nearly every mainstream labor union sought to close America's shores to foreigners, even though many of the rank and file of the movement, as well as prominent leaders such as AFL president Samuel Gompers, were first or second-generation immigrants themselves. The labor establishment used a variety of arguments to justify its restrictionist views, expressed primarily in economic and racial terms.

The nature of the mainstream labor movement's position was on full display in the congressional battles of the early 1920s over immigration, which ultimately culminated in the passage of the 1924 Quota Act drastically limiting immigration to the country. In these debates, the AFL — the largest conglomeration of unions at the time — consistently matched the rhetoric and policy prescriptions of the most vehemently anti-immigrant politicians, using the post-war recession as justification to argue for a "complete restriction" of immigration (Proceedings of 41st Annual AFL Convention, 1921). "The great increase in unemployment," AFL leaders declared, "made it imperative." Anti-Chinese sentiments were particularly widespread among unionists during this period, with usage of the offensive term "coolie" prevalent at AFL conventions and in labor leaders' writings. "Ninety-nine out of every 100 Chinese are gamblers," wrote Gompers. "The Yellow Man finds it natural to lie, cheat, and murder." (cited in Mann, 1953).

While attitudes towards Asians may have appeared more overtly

racist than towards Europeans, the policy prescription was largely the same for both. Foreigners would “flood[]” the country with “surplus labor,” AFL leaders warned, displacing financially pressed American workers. (Proceedings of 41st Annual AFL Convention, 1921). In their view, this necessitated closing America’s borders to all prospective immigrants, no matter their countries of origin.

Union leaders did not only seek to manufacture a divide between their rank-and-file and desperate foreigners. In this period of great strife between management and employees, AFL

leaders directed their members’ anger toward large employers for their allegedly insufficient loyalty to native workers. Federation Secretary Morrison, for instance, quoted US Steel President Elbert Gary in an attempt to prove to his members that it was big business who was responsible for imposing “cheap” labor on the country. “There are four million Chinamen we can secure to do agricultural work,” Morrison ominously quoted Gary as saying, conveniently leaving aside the important fact that such workers would likely not come into competition with the largely urban-based, craft-heavy AFL workforce (Report of 39th Annual AFL Convention, 1919).

Not only did mainstream labor unions denounce the flow of immigrants from abroad, but many continued their assault on these individuals once they reached America’s shores. The United Garment Workers, for instance, specifically rebuked the “charitable agencies” that helped facilitate immigration and demanded that prospective immigrants “pay their full footing” rather than receive assistance. (Proceedings of 18th United Garment Workers of America Convention, 1914; Parmet, 2005).

The widespread hostility towards immigrant workers and liberal immigration policy among AFL unions was not universal, however. The Amalgamated Clothing Workers of America and a handful of other progressive-leaning unions, for instance, did not directly advocate for immigration restrictions (Amalgamated Bank, 2019).² But perhaps the largest and most committed contingent within the AFL pushing back against its position was a small group of predominantly-female unions, led by the ILGWU and WTUL.

The Origins of the Women’s Labor Unions

The ILGWU and WTUL both got their start in the first years of the 20th century during a period of rising immigration and increasing entrance of women into the workforce. While wedded together by a shared commitment to representing low-wage — and predominantly immigrant — female workers, the composition of the unions’ leaderships was distinct. The ILGWU’s largely male leadership came from a working-class, socialist background; the WTUL, on the other hand, was led by a mix of working-class and elite, upper-class women, many with backgrounds in the settlement house movement. Still, leaders migrated between the two unions — including two prominent unionists, Rose Schneiderman and Clara Lemlich — and they maintained a collaborative relationship (Jewish Women’s Archive, 2009). That relationship came to fruition in the 1909 New York Shirtwaist Strike, a transformational moment for the unions and their workforces. The strike, involving tens of thousands of low-income female workers, helped “breathe new

2. Gompers strongly opposed the induction of the Amalgamated Clothing Workers of America (which later merged with the ILGWU) into the AFL, against the pleas of the ILGWU. Gompers deemed the ACWA a dual union in opposition to the United Garment Workers, an existing AFL affiliate, which prevented the ACWA from joining for decades.

life into a struggling immigrant labor movement.” (Orleck, 2017).

In the 1910s and 1920s, as the immigration issue reached a fever pitch, these women’s unions waged a multi-pronged attack on the labor movement’s restrictionist views and their underlying premises. In doing so, the ILGWU and WTUL not only laid bare the specious economic arguments and lack of moral rectitude displayed by the AFL but actively worked to ameliorate the deplorable conditions faced by many immigrants at the time.

As the labor movement at large fear-mongered about the alleged relationship between higher immigration levels and increased unemployment, for instance, the ILGWU struck a far different tone. “There are millions of unemployed workers of other countries, some of them starving,” an ILGWU delegate argued. The notion that the American worker can “maintain his high standard of living” while the “European workers are starving” is “erroneous,” declared the union (New York Tribune, 1922). This attempt at evoking cross-border solidarity exemplifies the union’s desire to lay the groundwork for generating broader societal acceptance of immigration. Moreover, the recognition of the plight of foreigners not only in light of their humanity but specifically their status as “workers” is prevalent in ILGWU writings and speeches, likely in part a reflection of the union’s predominantly low-income immigrant membership. The focus on this part of foreigners’ identity seemed to distinguish the union from its counterparts in the settlement house movement, with which it was largely aligned on immigration policy but which emphasized cultural assimilation and amelioration of urban poverty.

The ILGWU, with a dispersed rather than top-heavy power structure, relied on its dozens of locals across the county for its strength.³ That meant leaders often faced pressure from below to take a more confrontationally progressive stance on immigration. In 1925, for instance, delegates from multiple locals submitted resolutions excoriating ILGWU leaders for their perceived passivity in not pushing back against the AFL’s anti-immigrant rhetoric at the Federation’s last annual convention. “The representatives of our International to the AFL have ignored the decision of the last convention in which they are instructed to oppose any restriction of immigration,” read one resolution (Report of General Executive Board to 18th ILGWU Convention, 1925). The perceived inaction on the part of the ILGWU representatives, while likely not ideologically driven, reflected the difficult balancing act they faced in representing a largely immigrant rank and file while also relying on the AFL for financial support (Parmet, 2005).

Despite broad support among national leaders of the two women’s unions for combating anti-immigrant sentiments, some local leaders and rank-and-file members did not share those views. Melinda Scott, president of the New York chapter of the WTUL, sought to reorient the union’s focus towards skilled, native-born women in a craft unionist mold, arguing that attempting to organize immigrant women was a fruitless endeavor. She also strongly favored immigration restrictions (Dye, 1980). While opposition to immigration was less widespread within the ILGWU, some of its locals maintained more assimilationist attitudes than the national leadership. For instance, the ILGWU considered and ultimately voted down a resolution at its 1912 convention submitted by one of its locals that would have required the union to conduct all business

3. The WTUL maintained a more centralized structure, with a few large branches such as in Chicago and New York.

in English (Proceedings of 11th ILGWU Convention, 1912). These internal debates — in which the unions' more immigration-friendly elements usually emerged victorious — in part reflected the diversity of backgrounds, ethnicities, and local conditions that composed this emerging national female labor movement.

Fighting Back Against the Labor Establishment

In seeking to undermine the AFL's economic justifications for restricting immigration, the ILGWU and WTUL both acknowledged that employers could exploit immigrant labor to the detriment of native workers. But unlike the AFL, which used this reality as yet further reason to denounce immigration, the women's unions called for furnishing newly arrived immigrants with the requisite support to prosper alongside natives. "Exploited and injured themselves, these [immigrants] become the unconscious instruments of hardly less ruthless exploitation...to their fellows in the competitive struggle for a bare subsistence," wrote Alice Henry, editor of the WTUL's official publication, "Life and Labor" (Henry, 1915). Poor immigrants, she noted, had hitherto been "used industrially as an instrument to make life harder" for American workers. "Would it not be equally natural and far more fair to utilize his presence among us to raise our civic and economic and industrial standards?" The ILGWU also exposed the shallowness of the AFL's contention that immigration brought an excess supply of labor. "Each immigrant...is also a consumer, thereby creating a demand for the labor of other workers in this country," the ILGWU declared at its 1924 convention (Report of General Executive Board to 17th ILGWU Convention, 1924). This positive and self-perpetuating effect of immigration seemed to elude the AFL's leaders at the time, perhaps out of ignorance or more likely, purposeful omission.

World War I brought a concerted effort by the ILGWU to highlight the human suffering transpiring in Europe and to make the case for allowing millions to immigrate to America. The union used the front page of its magazine in November 1914 to strenuously push back against those opposed to accepting European refugees (*The Ladies' Garment Worker*, 1914). After devoting multiple paragraphs to detailing the "starvation, sickness and death" facing European women, in particular, the article dramatically shifted its focus. Rather than trying to elicit the reader's empathy, it instead trumpeted immigrants' ability to increase U.S. industrial production. This emphasis on the supposed economic benefits of increased immigration implicitly acknowledged a disheartening reality; highlighting foreigners' deprivation alone would likely not win over skeptical readers. "America will want every man or woman willing and able to work, and she will greatly profit by the coming of these industrious and thrifty people," the union wrote. "The ladies' garment industry...has been advanced to its present volume by the energy, enterprise and labor of immigrants" (*The Ladies' Garment Worker*, 1914). It is clear that the ILGWU was on the defensive against the prevailing tides of anti-immigrant sentiment coursing through the nation. The mere presence, for instance, of an entire section of the editorial entitled "No Fear of Lowering Standards" shows the space and effort the union devoted just to refute the notion that immigrants brought down wages for natives.

The female unions, though, went beyond simply criticizing the outlines of the AFL's anti-immigration position; they also homed in on issues specific to female immigrants. WTUL leaders attempted to bring to light and ameliorate the travails of young immigrant women, particularly the elevated risk these women faced at the

hands of unscrupulous employers. For example, Grace Abbott, a prominent member of the League, highlighted the findings of the 1911 Chicago Vice Commission in a 1917 book entitled *The Immigrant and the Community*. Of the 28 employment agents the commission had investigated, she noted, thirteen supplied women to pimps, and even more disconcerting, half of "immigrant homes" did so as well. "The opportunity for the moral exploitation of the immigrant girl by the employment agent is apparent," Abbott warned (Abbott, 1917). The security offered by a union such as the League, WTUL leaders argued, was vital to reducing the threat posed to vulnerable immigrant women. "This danger would lessen if the trade-union movement among women were...strong and...extensive," declared Henry, the "Life and Labor" editor (Henry, 1915).

ILGWU and WTUL leaders also fought to end the gender discrimination that had been ingrained in the country's immigration laws for decades. At the time, a woman forfeited her American citizenship if she married a foreigner, and did not automatically gain citizenship when her husband was naturalized, both policies imposed only on female immigrants. "The fact that women do not become citizens by the naturalization of their husbands presents...a very serious problem to the working class," declared Meyer London, the ILGWU's counsel. Meyer tied this "cruel" policy to the quest for electoral power, arguing that its implementation constituted an attempt by "rich ladies" to deny the vote to low-income immigrant women (London, 1914). The WTUL, alongside a myriad of other influential women's groups at the time, lobbied Congress for an "independent citizenship" law, which finally succeeded with the 1922 passage of the Cable Act (Bredbenner, 2018; Sochen, 1973). The union also remained vigilant in later years about exposing the ways in which gender discrimination persisted — albeit in a less explicit fashion — throughout the U.S. immigration system (Proceedings of 10th Biennial Convention, 1926).

Notwithstanding their commitment to supporting a liberal immigration policy, the ILGWU and WTUL appeared to slightly modify the way they framed the issue when lobbying those more skeptical of immigration, at times perpetuating commonly-held tropes about the supposed need for immigrants to quickly assimilate. For instance, in expressing his opposition to the AFL's anti-immigration position in 1922, the ILGWU delegate to the Federation's convention trumpeted the fact that ILGWU members had "become good American citizens and had succeeded in maintaining a high standard of wages and working conditions in the organization" (Proceedings of 42nd Annual AFL Convention, 1922). And on one occasion, the WTUL gave a platform to AFL Secretary Frank Morris in its magazine, allowing him to vent his opposition to immigration. In Morris's message, though, one can glean a reframing of the issue in the opposite direction to appeal to his more pro-immigration audience, adopting a somewhat more conciliatory tone relative to the nativist rhetoric the AFL commonly employed. "Labor does not desire to lessen the opportunity for every man, woman, and child to obtain a better life," he wrote. Portraying immigrants as victims rather than oppressors as the AFL often did, Morris went on to decry employers' exploitation of immigrant workers. "The immigrant and his family are looked upon as 'labor commodity,'" he wrote. "They are forced to compete for a job, to the joy of the capitalist (Morrison, 1921).

Helping Their Own

The ILGWU's devotion to helping naturalize its own immigrant workers proceeded in parallel with its efforts to confront the aggressive tactics employed by the government and employers against non-citizen workers. Though nominally aimed at subversives, the government at times applied deportation laws towards labor unions in ways that suggested only minimal adherence to the laws' aims. Immigrant workers, both male and female, consistently faced the threat of deportation for union activities, perhaps most infamously illustrated in the Bisbee Deportation of 1917, in which a posse deported over 1,000 striking miners and ordinary bystanders to Mexico without even a semblance of due process (Bonnand, 2020). Low-income immigrant women, because of their precarious position in society, bore their fair share of these assaults. For instance, the ILGWU heard a plea from a New England union at its 1920 convention about the potential deportations of "seven hundred men and women" for the "crime" of "having ideals." These are "members of the working class," they urged, and "their fight is your fight" (Report of General Executive Board to 15th ILGWU Convention, 1920). Similarly, a 1924 resolution adopted by the ILGWU condemned a pending bill in Congress that would have spelled the loss of naturalization for any immigrant participating in strikes (Report of General Executive Board to 17th ILGWU Convention, 1924).

While men likely faced the majority of prosecutions and deportations in this era for allegedly subversive activities, it would be misguided to downplay the threat facing female immigrant workers as well. After all, female unionists during this period regularly relied on strikes to win wage gains and working protections, some of which were unprecedented in their size, militancy, and predominantly female and immigrant composition.⁴ "For the first time in the history of organized labor, an army of 30,000 employees, 90 percent of whom were young women, braved cold and hunger, and suffered police persecution and imprisonment, in order to put an end to the intolerable conditions existing in their shops," the union told its members triumphantly, referring to the famous New York Shirtwaist Strike of 1909 that it had helped to organize (*The Ladies' Garment Worker*, 1913).⁵

The female unions' rhetorical and monetary commitments to naturalization efforts highlight the vital importance for their members of obtaining citizenship in ensuring the threat of deportation could not be used as a cudgel against labor organizing. For instance, at the ILGWU's 1920 convention, the union voted to allocate \$5,000 to the Immigrant Aid Society and \$500 to the Naturalization Aid League, organizations that helped immigrants navigate the citizenship process. And between 1922 and 1924, the ILGWU donated more to the Hebrew Immigrant Aid Society than to almost any other group (Report of General Executive Board to 17th ILGWU Convention, 1924). "The acquisition of citizenship is a part of their

4. The numerous strikes led by women between 1909 and 1915 — such as the New York Shirtwaist Strike of 1909, the Muscatine Button Workers' Strike of 1911-1912, and a strike of 35,000 underwear and kimono makers in 1913 — led scholar Mildred Moore to coin the term "industrial feminism" to describe the distinctly class-conscious nature of these strikes.

5. The "Great Revolt" of cloak makers in 1910, the Chicago Garment Workers' Strike, and other walk-outs throughout the 1910s and 1920s were led by women and composed of thousands of largely immigrant low-income workers.

equipment in the everyday struggle which they are compelled to wage for their rights as workers," the ILGWU declared in 1922 (Report of General Executive Board to 15th ILGWU Convention, 1920). And in the wake of the 1924 Quota Act's passage, the ILGWU only further upped its efforts to naturalize members, recognizing that without the near-constant stream of immigrants from Europe that had helped grow the union in the prior four decades, its most urgent task was to secure the status of its existing workforce.

Grappling with Assimilationism

Nonetheless, the two female unions maintained a nuanced and often uneasy relationship with the aggressive Americanization that characterized the United States' approach to naturalization at the time. On this issue, the two unions split most clearly, with the WTUL taking a more patronizing and assimilationist approach, though not always to the chagrin of the immigrant women themselves. The Immigrants' Protective League of Chicago, developed out of programs of the WTUL, perhaps best illustrates the union's approach to Americanization and how it was received by immigrant women. "Its paternalistic and benevolent style was not unfamiliar to women and those who came from immigrant families seemed particularly impressed with its Americanizing aspects," wrote historian Alice Kessler-Harris. "Young immigrant girls spoke with awe of the 'fine ladies' of the WTUL and did not object to the folk-dancing classes that were part of the Chicago Immigrant Protective League's program" (Kessler-Harris, 1975). While the reception may have appeared positive, the underlying motivations of the programs arguably played into the racially infused concerns of anti-immigrant forces within the country. By purging these new immigrants of their past cultures, the League sought to prevent the immigrants from turning against the United States' "ideals and institutions." (Leonard, 1973). Those fears originated in part from notions about the alleged irreconcilability of certain cultures with that of the United States. The ultimate aim of the League's initiative, though, aligned them with the ILGWU and other progressive-leaning organizations: to render immigration restriction unnecessary.

WTUL leaders nonetheless recognized the risks of taking these Americanization efforts too far, in light of the already tenuous mental well-being of these vulnerable young immigrants. "A too rapid Americanization is dangerous, and the girl who leaves her own people and eats strange American food, learns a new language, and gives up her old country clothes and manners, often wrongly concludes that all her old-world ideals are to be abandoned," warned Abbott, the Protective League's director (Abbott, 1917).

This more cautious attitude was characteristic of ILGWU leaders. The union recognized the necessity of teaching its immigrant members to speak English as quickly as possible, hiring at least 40 teachers devoted to English instruction in 1922 (Report of General Executive Board to 16th ILGWU Convention, 1922). But leaders also sought to facilitate a smoother transition for its immigrant members by printing the union's magazine in multiple languages, allowing locals to conduct their meetings in any language and offering courses and lectures to members in Yiddish (*The Ladies' Garment Worker*, 1911; Proceedings of 11th ILGWU Convention, 1912). In New York City, though, these aspirations ran up against the Board of Education, which threatened to prevent the ILGWU from using its facilities if it continued to teach in languages other than English. Despite protests from the rank and file, ILGWU leadership had no choice but to accommodate the Board's demands

(Orleck, 2017). The dispute reveals the depth of the structural barriers faced by the ILGWU in supporting its immigrant members. It also demonstrates how the financial and practical necessities of a cash-strapped union at times trumped its moral qualms about aggressive assimilation.

The difference in attitude towards Americanization between the ILGWU and WTUL likely reflects in large part the distinct backgrounds of the two unions' leaderships. The WTUL's largely upper-class, American-born leadership brought up in the settlement house movement were known to maintain more assimilationist attitudes than the immigrant-born — and largely socialist — leadership of the ILGWU.

The Blind Spot of Asian Immigration

Whether or not these actions alone illustrated a willingness on the part of the women's unions to give up the moral high ground on immigration when it suited their practical interests is debatable. Their views on non-white immigration, though, demonstrate the underlying contingencies embedded in their position on immigration. Because of the Chinese Exclusion Act and other discriminatory laws already on the books that severely curtailed Asian immigration, much of the debate in this period centered around immigration from Europe. Nonetheless, the women's unions' hesitancy to vocally support immigration from Asia and to lift up the struggles of Asian immigrants within their ranks reflects how deeply this Euro-centrism ran at the time, even in their largely pro-immigrant circles. At the WTUL's 1909 convention, for instance, multiple speakers denounced immigration from Asia as a cause of unnecessary competition with native workers (Henry and Franklin, Date Unknown), seemingly a talking point of the AFL and other restriction advocates. Rather than rebut these arguments, WTUL President Margaret Robins called the exchange "very valuable" and pinned the disagreement on the "different parts of the country" that the delegates represented.⁶ And in later years, when the union decided to appoint its vice presidents based on national origin, it declined to include one with Asian roots. This exclusion rested in part on a "race-based double standard" that refused to model unionism on anything but along "Western lines," according to historian Dorothy Cobble (Cobble, 2014). Nonetheless, it bears noting that the WTUL accorded a level of respect to Asian immigrants that was incomparable to the vitriol displayed by the AFL's leaders.

The ILGWU was less equivocal in its support for Asian immigrants, but nonetheless devoted little space in its magazine or at its annual conventions to the unique challenges these immigrants faced, especially relative to those from Europe. Instead, ILGWU leaders had to spend time and energy suppressing the anti-Asian sentiment within their ranks. At its 1912 convention, for instance, the union struck down a proposed addition to its bylaws preventing any local that was majority-Asian to be granted a charter (Proceedings of 11th ILGWU Convention, 1912). It is abundantly clear that the ILGWU would never have even considered a comparable resolution aimed at European immigrants.

Exploring Motivations

Despite the women's unions' disproportionate focus on European immigrants, their commitment to combating immigration

6. The resolution calling for expanding the Chinese Exclusion Act to "all Asiatics" was ultimately voted down.

restrictions in broad strokes should not be minimized, especially in light of the broader AFL's vitriolic and influential opposition campaign. In fact, on multiple occasions, their voices of opposition rang as lonely calls against xenophobia and exclusion within a labor movement unwilling to entertain their pleas. For example, when the AFL once again declared its commitment to pushing for immigration restrictions at its 1916 convention, only two motions of dissent were submitted: one by the ILGWU, represented by tens of thousands of women, and one by a single mineral waters workers' local (Proceedings of 36th Annual AFL Convention, 1916). The WTUL, on the other hand, often attempted to gain influence through less confrontational means, but their advocacy on behalf of young female immigrant workers, in particular, was arguably unmatched by even the ILGWU.

The factors motivating the unions' position on immigration are numerous, centering primarily on their international outlook, left-leaning ideology, and the nature of their members' work. The female unions' marginalization within the AFL, though, may be in part why the nature of their opposition, their motivations, and the divisions within and between them remain largely unexamined in the literature. Much of the existing literature, in fact, has largely sidestepped the debate over national immigration policy in favor of a focus on the individual immigrants who composed the ILGWU and other female unions. For example, Sidorick (2004) examined how young immigrant garment workers in Philadelphia in 1909 forged alliances with upper-class supporters from the WTUL to extract significant concessions from mill owners. Other research has looked into the contemporaneous garment worker strike in New York (e.g., Schofield 1984), as well as the 1912 Lawrence Strike (e.g., Farrant et al. 2014), in particular how cross-ethnic alliance of women confronted not only management but also the powerful conservative bloc of the trade union movement, eventually helping catalyze a broad-based, industrial labor movement that later broke away from the AFL to form the Congress of Industrial Organizations.

When it was founded in New York City at the turn of the 20th century, the ILGWU included the word "international" in its title with the intention of expanding to Canada (ILGWU Toronto Dressmakers Joint Council). While the union ultimately did not gain a significant foothold outside of the United States until the 1930s, from its earliest years, it saw its purview as beyond just its low-income American members. This is evident in the way the union described the moral dimensions of the immigration issue and in how third-party observers viewed the ILGWU's position. "They now propose a solution to the immigration question...not by national legislation, but by international information and agreement," read a contemporary depiction of the union's position in the *Christian Science Monitor* ("The Tailors' International," 1920). This portrayal seems misguided at best, given that the ILGWU wrote its platform based largely on the demands of its locals, rather than in consultation with foreign unions, and that it consistently lobbied Congress — the authors of such "national legislation" — to change the immigration laws. Nonetheless, this newspaper's perspective, which evinces suspicion and even derision, reflects the way in which other labor groups and society at large viewed the ILGWU. It also suggests how these groups could dismiss the union's position on immigration by virtue of its alleged association with outsiders, thereby conveniently sidestepping the numerous benefits labor could gain from increased immigration. Still, the newspaper portrayal has an element of truth to it; the ILGWU's concern for suffering

Europeans during World War I was heartfelt, evident not only in the union's rhetoric but also its monetary allocations. The ILGWU donated \$150,000 to East European relief in 1919 (roughly \$2.2 million in today's dollars), a not-insignificant sum for the still fledgling organization (Stolberg, 1944).⁷

While the WTUL often toed a more moderate line ideologically — likely a result of its largely upper-class leadership and attempts to inculcate a working relationship with the AFL — the rhetoric of its leaders on the issue of immigration at times evoked a cross-border, even socialist spirit (Foner, 1979). In 1912, for instance, Abbott bemoaned the labor movement's failure to “appreciate our common interest” in the “democratic movements of the world” (Abbott, 1921). And as a daughter of immigrants, President Robins was a “fierce internationalist,” viewing domestic and foreign policy issues through a lens that naturally aligned with a more liberal immigration stance (Cobble, 2014). The ILGWU was even more committed to such cross-border solidarity in part due to its ideological leanings, with committed socialists populating its upper echelons from the union's earliest days.⁸

The WTUL's international outlook can also be attributed in part to simple financial necessity. The national organization and local chapters remained in difficult financial straits for the union's entire 47-year existence, often relying on foreign unions for financial assistance. “More and more are we looking to...the international unions...to place us in the position of self-supporting organization,” said the union's delegate to the 1921 AFL convention (“Address of Miss Emma Steghagen,” 1921). In the process, the WTUL also forged longer-term partnerships with these largely European unions. For instance, the WTUL convened a conference of female labor leaders in the early 1920s from 19 countries, called the International Congress of Working Women, which soon morphed into a permanent bureau based in Washington, D.C. In short, the ideological predispositions and practical financial considerations of both of the women's unions likely predisposed them to view free immigration as a benefit to their organizations and the working-class women that composed their membership base.

The two women's unions also differentiated themselves from the AFL during the 1910s and 1920s by the nature of their members' low-skilled and low-wage work. The AFL — largely composed of craft unions at the time — was notorious for imposing strict entrance requirements that excluded women, immigrants, and African Americans. The women's unions, on the other hand, constituted part of the small but growing industrial unionism movement, whose interests often conflicted with that of the craft unions. In contrast to craft unions' tendency to close ranks to secure existing members' wages, industrial unions often relied on mass strikes to bring improvements — albeit incremental — to the brutal working

conditions they faced.⁹ The ILGWU and WTUL, for instance, took a keen interest in the Lawrence Strike, as well as other large “industrial upheavals,” in Henry's terms, praising them for highlighting the travails of the “immigrant girl” to the country (Henry, 1915). AFL leaders, by contrast, denounced the Lawrence Strike as “inhuman” (McPherson, 1912).

Particularly for the WTUL, the importance of forging a distinctly feminist identity — composed of immigrant and native alike — was inseparable from its policy agenda. It is hard to dispute the notion that one of the only threads holding together upper-class women — colloquially known as the “mink brigade” — and the young immigrant girls they marched alongside in the Shirtwaist Strike and other uprisings was their gender. The livelihoods of these immigrant women depended on the support of WTUL leaders, who in turn promoted policies beneficial to their members. And unlike the ILGWU, which was primarily focused on securing better wages and working conditions for its workers, the WTUL was also deeply involved in other issues of concern to women at the time, especially suffrage. Those other pursuits helped embed the WTUL into a vast network of organizations making up the contemporary ‘social purity’ movement, giving the union's leaders access to its deeper pockets. In seeking to raise funds for striking immigrant garment workers in Philadelphia in 1909, for example, WTUL President Robins drew a direct connection between the strikers' cause and women's suffrage, helping convince the Pennsylvania Women's Suffrage Association and allied organizations to provide not only financial support but also on-the-ground assistance (Sidorick, 2004).

The female unions' lack of influence within the AFL, though, left them with little more than the ability to protest as the Federation held strong to its anti-immigrant views throughout the 1910s and 1920s. Their lack of power and influence can be attributed to a variety of factors, primarily stemming from the unions' gender and largely immigrant composition. In short, some of the very factors that likely galvanized the unions to adopt a more progressive-minded immigration position prevented them from exercising influence on that very issue. The ILGWU in particular was composed largely of Jewish immigrant workers in its early years, which had implications for the respect afforded to them by the AFL.¹⁰ The largely gentile AFL leadership was well-known for harboring anti-Semitic sentiments (which sometimes spilled over into overt instances of bigotry), rendering it difficult for the ILGWU to win converts from the AFL on immigration and other issues (Parmet, 2005).

Perhaps most crucially, though, the women's unions' campaign to win support for a liberal immigration stance within the AFL appeared to be in part stymied by male unionists' hostility towards female labor overall and women's unions in particular. As late as 1925, the AFL remained “profoundly ambivalent about the fate of more than eight million wage-earning locals, for instance, justifying the policy with sexist notions about women's perceived inability to work in manual occupations (Amsterdam, 1982). In this respect,

7. The ILGWU's leadership in fact grew so eager to help its brethren in Europe in the 1930s that it devised a dubious scheme to compel female workers in Allentown, PA to make donations to a German refugee fund by skimming money off their paychecks without their consent (Downey, 2009). Perhaps the German background of the ILGWU's first president, Benjamin Schlesinger (served from 1903-1907, 1914-1923, and 1928-1932) contributed to this particularly vigorous campaign to support refugees from his native country.

8. Schlesinger was a committed member of the Socialist Party, as were the ILGWU's other early presidents (Asher, 1976).

9. The Triangle Shirtwaist Factory was perhaps the most tragic example of the poor working conditions in the garment industry and other largely female occupations.

10. The union became more diverse (with an influx of Italians, in particular) as immigration declined overall and Jews became reluctant to have their children “follow them into manual occupations,” according to Parmet (Parmet, 2005).

the WTUL — whose female leadership grappled with unique isolation in its early years of AFL membership, including pressure to subordinate its non-economic priorities like suffrage — was often at an even sharper disadvantage than the IGLW (Dye, 1975).

Conclusion

After the passage of the 1924 Quota Act, immigration receded from the national political scene as a central issue, to the detriment of millions of refugees, including those escaping the Holocaust. Decades later, the Civil Rights Movement brought the issue back to center stage, culminating in a 1965 law that liberalized the country's immigration system. Concomitant with the country's changing attitudes, the labor movement's views also began to slowly shift; by the turn of the 21st century, the AFL-CIO had completely altered its position, announcing it would now be championing immigrant rights. Nearly a century after the ILGWU and WTUL issued a clarion call to the AFL and the country at large urging a more humane immigration policy, the labor movement's leadership belatedly caught up.

The WTUL and ILGWU went in dramatically different directions on immigration after their temporary alignment in the early 20th century. By the late 1920s, the WTUL began to grow more reticent to push back against immigration restrictions, instead merely offering support to immigrants once they reached America's shores. At its 1929 convention, union leaders pledged to support "any immigration measure" backed by the AFL, reflective of the WTUL's desperate attempts to win the financial support of the labor establishment (Proceedings of 11th Biennial Convention, 1929). With funds evaporating, the union officially disbanded in 1950. Meanwhile, the ILGWU only stepped up its support for immigration and continued to maintain a sizable immigrant membership. In the 1980s, the ILGWU created a formal Immigration Project, helping affected individuals with immigration, naturalization, and amnesty matters. That initiative coalesced into an active lobbying group at the state and local level, fighting against anti-immigrant ballot propositions.¹¹ Unlike in decades past, though, they now have plentiful allies throughout the labor establishment.

11. The ILGWU merged with the ACWA in 1995 to become UNITE, which later merged with the Hotel Employees and Restaurant Employees Union to become UNITE HERE.

References

- Abbott, G. (1917). *The Immigrant and the Community*. New York, NY: The Century Co.
- Abbott, G. (1921). "The Immigration Bill." *Life and Labor*.
- "Address of Miss Emma Steghagen" (1921). In *Report of the Proceedings of the 41st Annual Convention of the American Federation of Labor*. Washington, DC: Law Reporter Printing Company.
- Amsterdam, S. (1982). "The National Women's Trade Union League." *Social Service Review* 56, no. 2: 259-72.
- Asher, R. (1976). "Jewish Unions and the American Federation of Labor Power Structure, 1903-1935." *American Jewish Historical Quarterly* 65, no. 3: 215-27.
- Bonnard, S. "Overview." *The Bisbee Deportation of 1917*. University of Arizona. <http://www.library.arizona.edu/exhibits/bisbee/history/overview.html>.
- Bredbenner, C. L. (2018). *A Nationality of Her Own: Women, Marriage, and the Law of Citizenship*. Berkeley, CA: University of California Press.
- "Cable Act Amendment" (1926). In *Proceedings of the 10th Biennial Convention*. Kansas City.
- Cobble, D.S. (2014). "A Higher 'Standard of Life' for the World: U.S. Labor Women's Reform Internationalism and the Legacies of 1919." *The Journal of American History* 100, no. 4.
- Correspondent Staff. (1922). "Brotherhoods Asked to Join Strike Council." *New York Tribune*.
- "Donations to Other Organizations" (1924). In *Report of the General Executive Board to the 17th Convention of the International Ladies' Garment Workers' Union*.
- Downey, K. (2009). *The Woman behind the New Deal: The Life of Frances Perkins, FDR's Secretary of Labor and His Moral Conscience*. New York, NY: Doubleday.
- Dye, N.S. (1975). "Feminism or Unionism? The New York Women's Trade Union League and the Labor Movement." *Feminist Studies* 3, No. 1/2: 111-25.
- Dye, N.S. (1980). *As Equals and as Sisters: Feminism, the Labor Movement, and the Women's Trade Union League of New York*. Columbia, MS: University of Missouri Press.
- "Editorial." (1913). *The Ladies' Garment Worker*.
- "Federal Legislation." (1929). In *Proceedings of the 11th Biennial Convention*. Washington.
- Foner, P. S. (1979). *History of the Labor Movement in the US*. Vol. 6. New York, NY: International Publishers.
- Farrant, Robert, Siegenthaler, Jurg, Levenstein, Charles, and Wooding, John (2014). *The Great Lawrence Textile Strike of 1912*. Work, Health and Environment Series. Amityville: Routledge.
- Gonyea, D. (2013). "How The Labor Movement Did A 180 On Immigration." NPR.
- Hearing before the Joint Committees on Labor Congress of the United States (1920). Washington, DC: Government Printing Office.
- Henry, A. M., and Franklin, S. M. "Discussion of Alien Question." *Ann Arbor, MI: University of Michigan*.
- Henry, A. (1915). *Trade Union Woman*. New York, NY: D. Appleton and Company.
- "ILGWU Toronto Dressmakers Joint Council and Toronto Cloak Joint Board Records." *Guide to the ILGWU Toronto Dressmakers Joint Council and Toronto Cloak Joint Board Records*. Cornell University.
- "Immigration." (1914). In *Proceedings of the 18th Convention of the United Garment Workers of America*. Indianapolis, IN: United Garment Workers of America.
- "Immigration." (1921). In *Report of the Proceedings of the 41st Annual Convention of the American Federation of Labor*. Washington, DC: Law Reporter

- Printing Company.
- "Immigration" (1922). In Report of the Proceedings of the 42nd Annual Convention of the American Federation of Labor. Washington, DC: Law Reporter Printing Company.
- "International Ladies' Garment Workers' Union (ILGWU)." Encyclopedia of the Great Depression. Encyclopedia.com.
- Kessler-Harris, A. (1975). "Where Are the Organized Women Workers?" *Feminist Studies* 3, no. 1/2: 92-110.
- Leonard, H. B. (1973). "The Immigrants' Protective League of Chicago 1908-1921." *Journal of the Illinois State Historical Society* 66, no. 3: 271-84.
- Mann, A. (1953). "Gompers and the Irony of Racism." *The Antioch Review* 13, no. 2: 203-14.
- McPherson, J.B. (1912). *The Lawrence Strike of 1912*. Boston: Rockwell and Churchill Press. "Meyer London Response." (1924). In Report of the General Executive Board to the 17th Convention of the International Ladies' Garment Workers' Union. Boston.
- Morrison, F. (1921). "Labor and Immigration." *Life and Labor*.
- Orleck, A. (2009). "Clara Lemlich Shavelson." *Jewish Women: A Comprehensive Historical Encyclopedia*. Jewish Women's Archive.
- Orleck, A. (2009). "Rose Schneiderman." *Jewish Women: A Comprehensive Historical Encyclopedia*. Jewish Women's Archive.
- Orleck, A. (2017). *Common Sense and a Little Fire: Women and Working-Class Politics in the United States, 1900-1965*. Chapel Hill, NC: University of North Carolina Press.
- "Our Educational Activities" (1922). In Report of General Executive Board to the 16th Convention of International Ladies' Garment Workers' Union. Cleveland.
- Parmet, R. D. (2005). *The Master of Seventh Avenue: David Dubinsky and the American Labor Movement*. New York, NY: New York University Press.
- "President Gompers' Response." (1916). In Report of the Proceedings of the 36th Annual Convention of the American Federation of Labor. Washington, DC: Law Reporter Printing Company.
- "Prohibition of Immigration." (1919). In Report of the Proceedings of the 39th Annual Convention of the American Federation of Labor. Washington, DC: The Law Reporter Printing Company.
- "Protection of the Funds of the General Office." (1912). In Report and Proceedings of the 11th Convention of the International Ladies' Garment Workers Union. Toronto.
- "Report of Committee on Education." (1924). In Report of the General Executive Board to the 17th Convention of the International Ladies' Garment Workers' Union. Boston.
- "Research Guides: American Women: Resources from the Law Library: Federal Law Materials." *Federal Law Materials - American Women: Resources from the Law Library - Research Guides at Library of Congress*.
- "Resolution No. 15." (1925). In Report of the General Executive Board to the 18th Convention of the International Ladies' Garment Workers' Union. Philadelphia.
- "Resolution No. 29" (1912). In Report and Proceedings of the 11th Convention of the International Ladies' Garment Workers Union. Toronto.
- "Resolution No. 62" (1924). In Report of the General Executive Board to the 17th Convention of the International Ladies' Garment Workers' Union. Boston.
- "Resolution No. 100" (1924). In Report of the General Executive Board to the 17th Convention of the International Ladies' Garment Workers' Union. Boston.
- "Resolution No. 129." (1920). In Report of General Executive Board to the 15th Convention of International Ladies' Garment Workers' Union. Chicago.
- Schofield, Ann. "The Uprising of the 20,000: The Making of a Labor Legend" in *A Needle, a Bobbin, a Strike: Women Needleworkers in America, Women in the Political Economy* (1984). Philadelphia, PA: Temple University Press, 1984.
- Sidorick, Daniel (2004). "The "Girl Army": The Philadelphia Shirtwaist Strike of 1909-1910." *Penn State University Press* 71, no. 3: 323-69.
- Sochen, J. (1973). *Movers and Shakers: American Women Thinkers and Activists*. New York: Quadrangle.
- Stolberg, B. (1944). *Tailors Progress. The Story of a Famous Union and the Men Who Made It*. Garden City, NY: Doubleday, Doran & Co.
- The Ladies' Garment Worker. (1911). April 1, 1911. https://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1003&context=lgw_vol2.
- "The Suffering Toilers of Europe" (1914). *The Ladies' Garment Worker*.
- "The Tailors' International." (1920). *Christian Science Monitor*.
- Wolman, L. (1924). "Women in Trade Unions in 1910 and 1920." *National Bureau of Economic Research*, 97-108.
- "Workers' Defense Conference of New England" (1920). In Report of the General Executive Board to the 15th Convention of International Ladies' Garment Workers' Union. Chicago.

Choice Amnesia: When Difficult Product Choices are Harder to Remember

Julia S. Friedman
Harvard College '21

Consumers are frequently put in positions in which they would benefit from remembering their past product decisions. Yet how well do consumers remember the choices they have made, and is memory influenced by the difficulty of the decision? In Study 1, 403 participants were presented with pairs of products in an online survey and were asked to indicate which product of each pair they would rather buy. After completing a distraction task, participants were then tested for how well they could recall their previous decisions. As hypothesized, recall was worse for decisions that, according to a pretest, were more difficult to make. These results persisted after controlling for the type of product (i.e., shampoos, water bottles, salad dressings, and mugs). In Study 2, we examined a possible alternative explanation that these results were found only because participants selected the items they liked as opposed to actually remembering which items they had previously chosen. In this follow-up study, 301 participants made decisions between pairs of unpleasant items (i.e., bad-tasting jelly beans). All of these were disliked, and therefore participants could not simply select the items they liked. As hypothesized, among these disliked pairs, recall was again worse for decisions that were more difficult to make. Potential underlying mechanisms for these results are discussed.

Introduction

On a single grocery store run, consumers are faced with dozens of decisions – among them, which items to buy, which brands to choose, and within a brand, which flavor or variety to purchase. Consumer behavior is often dependent on an individual's ability to recall such prior decisions (e.g., which toothpaste did I select last time, and do I want to buy it again?). Yet how effectively do consumers remember past decisions? And what factors influence the accuracy of this recall? This thesis examines people's memory for the decisions they have made between products and assesses whether the difficulty of such decisions affects the accuracy with which people remember which product they chose. We investigate whether people exhibit a form of *choice amnesia* – that is, a tendency to forget a choice that one has previously made. Despite the fact that people overwhelmingly intuit that difficult decisions will be easier to remember (Chance & Norton, 2007) – perhaps because such decisions are thought to take more time and effort to make – there is conflicting support for this proposition in the literature. It is unclear from past research whether decision difficulty impacts memory, particularly within the context of consumer decision making. Understanding how reliably consumers remember prior product decisions is vitally important feedback, not only to consumers themselves but also to businesses deciding how to allocate their marketing dollars. Rather than going solely towards attracting new customers, these funds may be better spent on reminding and reinforcing the decisions that consumers have already made.

The first part of this thesis reviews the extant literature on decision difficulty and memory. It then presents a series of studies that directly examine this relationship.

Literature Review

Decision difficulty has typically been studied as a moderator or correlate of other phenomena of human cognition. Here we walk through what is known about decision difficulty as it has been studied using these different frames.

Decision Difficulty and Dissonance

Abundant research has shown that making difficult decisions between products creates anxiety. Consumers experience the highest rates of anxiety when these decisions concern products that are valued to a similar extent, particularly similarly high-valued products (Shenhav & Buckner, 2014). Reported anxiety, tracked by activity in regions of the dorsal mPFC, has been found to be significantly lower for less difficult decisions, i.e., those in which only one product in the pair is valued highly (Shenhav & Buckner, 2014). Similar results were found in a study by Gerard (1967), in which participants made decisions between two paintings while hooked up to a device measuring their finger-pulse amplitude. When people made decisions between paintings that were similarly liked, they showed large changes in finger-pulse amplitude immediately after making their decision. This indication of stress was significantly less likely to be found for decisions between paintings that were disparate in value (Gerard, 1967). Being required to make a difficult decision has similarly been found to increase heart rate and galvanic skin responses, both of which are associated with increased levels of stress (Janis & Mann, 1976; Mann, Janis, & Chaplin, 1969; Zhou et al., 2015).

This anxiety and discomfort experienced when choice alternatives are close in value is predicted by cognitive dissonance theory (Festinger, 1957). According to this theory, people experience discomfort when they hold conflicting attitudes, beliefs, or behaviors (Elliot & Devine, 1994). In order for a decision between two alternatives to be difficult, the chosen alternative must have some undesirable qualities, or the non-chosen alternative must have some redeeming qualities, or both. However, once the individual selects one item, these attitudes (against the chosen item, or in favor of the unchosen item) are in tension with the choice and therefore create dissonance (Brehm, 1956). Deciding on one of two nearly equal alternatives forces the individual to endure the undesirable features of the selected item and to forgo the positive features of the rejected item. Therefore, the more that alternatives are close in value, and the more difficult the choice then is, the more dissonance will be experienced.

Research has shown that strategies can be used to eliminate the discomfort induced by cognitive dissonance (Elliot & Devine, 1994). One such way to reduce dissonance is to forget that the event happened in the first place. Evidence suggests that stress and anxiety can lead to memory suppression (Ashton et al., 2020; Benoit et al., 2016; Depue et al., 2006; Anderson & Levy, 2009). Inhibitory control is an executive function that serves to stop memory retrieval and is engaged in the presence of stress to actively suppress memory (Anderson & Huddleston, 2012; Ashton et al., 2020). The dorsolateral prefrontal cortex, a key component of higher-order cognitive functions such as working memory, has been shown to have reduced activity following exposure to stress (McEwen & Morrison, 2013; Qin et al., 2009).

Not only does the experience of stress lead to lower working memory, it also has been shown to bring about *intentional* forgetting, the process of actively suppressing information that one does not wish to remember (Ashton, et al., 2020; Levy & Anderson, 2008; Anderson & Levy, 2009; Stramacchia et al., 2020). In order to maintain a positive state of being, it may be beneficial to eliminate access to unwanted emotional triggers by forgetting about these events. This can be done through various suppression mechanisms such as thought substitution – retrieving an alternative memory to occupy awareness – or direct retrieval suppression – stopping the process of memory retrieval altogether (Stramacchia et al., 2020). When information causes people discomfort or dissonance, they have the ability – and motivation – to remove these thoughts from their minds.

Decision Difficulty and Amnesia

There is extensive research on selective amnesia and intentional forgetting of highly unpleasant memories, yet the present thesis examines selective amnesia for more mundane memories than those described thus far. Specifically, the goal of this study is to assess memory for difficult *decisions* and whether the dissonance created by such decisions can bring about lower memory performance. We argue that it's possible that people may reduce cognitive dissonance by simply forgetting what decision they made altogether. Because the more difficult a decision is, the more dissonance it creates and the more motivation exists to reduce it, the tendency to forget what decision was made – a phenomenon we refer to as choice amnesia – is expected to increase as does the difficulty of a decision.

To this point, research examining the impact of decision difficulty on memory is very minimal. One study, however, did find that recognition of a previously shown item among alternatives is worse when the task is more difficult, as was determined by the similarity of the items and the length of time between presentation of an item and recall (Klein & Arbuckle, 1970). There is support in the literature for the proposition that decisions among similar alternatives are recalled with less accuracy than are decisions among more disparate alternatives (Bower & Glass, 1976; Shepard & Podgorny, 1978; Weaver & Stanny, 1978). Lower confidence in a decision, which could be associated with how difficult it was to make the decision, is also associated with lower recall accuracy (Bower & Glass, 1976; Weaver & Stanny, 1978).

Relatedly, there is some evidence that difficult decisions lead to less extensive and more simplistic processing (Luce et al., 1997). When required to make a complex decision, such as one involving multiple alternatives, people are more likely to use decision strategies that eliminate the alternatives quickly and involve only limited

search of information and evaluation of alternatives (Payne, 1976; Payne et al., 1988). More difficult or complex decisions are also more likely to employ attribute-based decision strategies (Luce et al., 1997). For example, if making a difficult decision is too taxing, people often turn to a simplified rule of thumb and investigate the alternatives on a single attribute (e.g., always choose the least expensive shampoo bottle). If people investigate the choice alternatives less extensively and resort to simplified rules when making their difficult decisions, it seems plausible that these decisions would be forgotten at a higher rate.

In fact, preliminary studies conducted by Levari and Norton (2019) found that recall for difficult decisions is inferior to recall for decisions that are more easily made. Levari and Norton studied this phenomenon by presenting participants with a series of color pairs and asking them to indicate their preference in each pair. Participants were then surprised with a recall task in which they were again presented with the same pairs and were asked which alternatives they chose before. The results show that the more difficult a decision was to make (determined by a pretest of decision difficulty), the less likely people were to remember what choice they made. This relationship persisted not only when participants were again presented with the pair but also when they were presented with the colors separately and asked, “Did you choose this color when you saw it before?” This increased the likelihood that they were remembering or failing to remember the decision they made before, as opposed to simply re-choosing between the products. The relationship also persisted when the similarity of the paired items was controlled for, showing that the worse recall was not simply due to the options in the difficult pairs being more similar to one another. Finally, these studies found that, paradoxically, recall was worse for decisions that took longer to make, even controlling for the difficulty of the decision (Levari & Norton, 2019). These findings are somewhat counterintuitive given that people often assume that more time and attention directed towards a decision will lead to stronger memories for the decision that was made.¹

While Levari and Norton (2019) found that difficult decisions were harder to remember, there is some evidence suggesting that memory is better for tasks that require greater attention and cognitive effort. Yet many of these studies assess participants' memory for words or paragraphs they've read, rather than decisions they've made between alternatives (Benton et al., 1983; Tyler et al., 1979). Some studies *have* examined recall for decision making and found that more difficult decisions were easier to remember. For instance, Jacoby et al. (1979) gave participants pairs of named items (e.g., crumb-tomato, bee-refrigerator) and asked them to decide, on a scale of 1 to 10, how large they believed the difference in size was between the two objects in the pair. The results of a recall task showed that more detailed processing, which was required when the pair items were similar in size, led to better recall of which item was paired with which. This assessment of recall differs from the

1. Chance and Norton (2007) tested these intuitions, asking participants whether they thought they would be more likely to remember a decision that was hard or easy for them to make. Participants' intuitions by and large go against the choice amnesia hypothesis; 82.8% of people anticipated remembering the difficult decision better, compared to only 17.2% who anticipated remembering the easy decision better. People also overwhelmingly stated that they would be more likely to remember a decision they spent a long time deliberating (Chance & Norton, 2007).

present study, however, because it assessed memory for which items were paired together, as opposed to memory for what decision was previously made. Another study did find that when decisions among items were more difficult, memory was better for minor attributes of the items (McClelland et al., 1987). Participants were presented with a list of cars as well as major and minor attributes about each car on the list. They were asked to make decisions about the cars that varied in difficulty. Memory for minor attributes was found to be better for the difficult decisions than it was for the easy decisions, likely because people use major attributes first when making a decision and only turn to the minor attributes when a difficult decision makes it absolutely necessary. Given that the present study examines recall for what choice was made, as opposed to recall for minor and major attributes about the items, we hypothesize that our results will better match Levari and Norton (2019), who found that recall is worse for more difficult decisions.

Research Questions and Hypotheses

With the present studies we hope to add to our understanding of the relationship between decision difficulty and memory, extending the inquiry to the realm of consumer decision-making among products. There is very minimal extant research on the effects of decision difficulty on memory, particularly as it relates to consumer decision-making. The question this thesis attempts to answer is whether the difficulty of a decision between alternatives influences people's ability to remember which alternative they chose. Specifically, when consumers make decisions between products, which decisions do they remember more accurately, hard decisions or easy ones? We hypothesized that consumer memory would be worse for more difficult product decisions. That is, when the decision between two products is hard to make, people will have worse recall for which product they ultimately chose. To test this, in Study 1, we showed participants a series of product pairs and had them choose between the two items in each pair. Then during a recall task they were shown each item individually and were asked whether they had chosen it when they saw it before.

In Study 2 we tested a potential alternative explanation for our hypothesized findings. It is possible that rather than remembering which item they chose, participants are simply using a 'liking heuristic,' in which they select the items they like the most and think, therefore, that they would have chosen before. We call this possibility the 'liking heuristic hypothesis.' It's possible that selecting the items they like the most is more challenging if the decision was more difficult to make. If, during the recall task, participants are simply selecting the items they like the most, it is more likely that they will claim to recall having chosen an item they did not in fact choose if the initial decision was difficult to make. So perhaps, we could get the same results that "recall" accuracy is worse for more difficult decisions, yet this would not relate to memory at all. In order to rule out this alternative explanation, we conducted a second study using pairs of disliked items. If, among pairs of disliked items, the choice amnesia results hold, this would suggest that participants are not simply selecting the items they like, given that they presumably do not like any of the items in this disliked category. We hypothesized that difficult decisions between disliked pairs would be remembered worse than easy decisions. The research questions and hypotheses for Study 1 and Study 2 are summarized in Table 1 following.

Study 1:	H1: Recall accuracy will be worse for more difficult product decisions.
Q1: Which decisions between products are remembered more accurately, hard decisions or easy ones?	H2: Decisions between pair-items that are liked to a similar extent will be more difficult to make and will have worse recall accuracy than decisions between pair-items more disparate in liking.
Study 2	H3: Difficult decisions between disliked pairs will be remembered worse than easy decisions between disliked pairs.
Q2: Are difficult decisions recalled less accurately or are participants simply claiming to have chosen the items they like?	H4: Among disliked pairs, decisions between pair-items that are liked to a similar extent will be more difficult to make and harder to recall than decisions between pair-items more disparate in liking.

Table 1. Research Questions and Hypotheses
Study 1

The goal of Study 1 was to assess whether the difficulty of a decision between products influences people's abilities to later remember what decision they made. In Study 1, participants made decisions of varying levels of difficulty, after which they were tested for how well they could recall their decisions. Decision difficulty and product-liking were determined via two pretests. In Pretest 1a, we asked participants to choose between products and indicate how difficult each decision was to make. Decision difficulty was operationalized as participants' self-reported ratings of how difficult each decision was on a scale from one to five. In Pretest 1b, instead of asking participants to decide between two products, we asked them to rate the products on a scale of 0 to 100. We used these ratings to determine mean pair-liking for the two options in each pair as well as the difference in liking between the pair's two options. We will refer to this difference in liking as the pair's *liking gap*. We assembled pairs of products in four different product categories – shampoos, water bottles, salad dressings, and mugs. These domains were selected so that any results we obtained would generalize beyond one particular product category. Each pretest and the main study were conducted as separate 8-10 minute online studies, administered through Mechanical Turk (MTurk), Amazon's online crowd-sourcing platform. A different set of U.S. adults participated in each pretest and the main study, and they were each paid \$0.80-\$1.00 USD for completion.

Study 1 Methods

In Pretest 1a, participants (N = 237, 53% male, Mage = 38.05) were presented with 40 pairs of products, one pair at a time, and were asked to select which product they would rather buy in each pair (see Image 1). After each choice, participants rated how difficult the choice was on a 5-point Likert scale from "not at all difficult" to "extremely difficult." To prevent fatigue, participants were randomly assigned to see pairs of products from only 2 of the 4 product domains. In the second pretest, participants (N = 240, 58% male, Mage = 38.13) were presented with 40 pairs of products, one pair at a time, and were asked to indicate how much they liked each product in the pair on a scale of 0 to 100. Unlike Pretest 1a, participants were not asked to make choices between the items in the pairs. The same product categories and product pairs as Pretest 1a were used. Again, to prevent fatigue, participants were randomly assigned to see products from only 2 of the 4 product categories. Pairs were created by randomly selecting two products from the category, and once they were created, pairs were kept constant for both pretests and the main study. Both the order in which the pairs were presented and the order of the products within each pair were randomized.

In Study 1, a different set of participants (N = 403, 50% male, Mage = 42.18) was presented with the same pairs of products as

Which of these two shampoos would you rather buy?



Image 1. Choice Task. Products are shown in pairs and participants are asked which of the two they would rather buy.

were used in Pretests 1a and 1b. During the choice task, participants were randomly assigned to see pairs from one of the four product categories (shampoos, water bottles, salad dressings, and mugs). For each pair, they were asked to indicate which product they would rather buy. After all the choices were done, they completed a distraction task in which they colored an unrelated image for one-minute. After doing so, participants were surprised with a recall task in which their memories were tested for the products they chose during the choice task. The exact same products from the choice task were shown again in a random order – individually, rather than in pairs – and participants were asked, “When you saw this product before, did you choose it?”. During the recall task, products were shown individually so as to limit participants’ abilities to simply rechoose which product in the pair they would rather buy. Participants’ demographic information was then collected through post-task questions.

Study 1 Results

Did the difficulty of the decision affect the accuracy with which the decision was recalled?

To examine whether the difficulty of a choice predicted recall accuracy, we fit a generalized linear mixed model to our data in R (R Core Team, 2020) using the lme4 package (v1.1.25; Bates et al., 2015). The dependent variable was the accuracy with which each decision was recalled. Recall for a particular product was accurate if participants correctly recalled choosing the item or correctly recalled not choosing the item. The independent variable was the mean rating of decision difficulty, as was determined in Pretest 1a. We included mean decision difficulty as a fixed effect in our model. As random effects, we included intercepts for (a) participants (who may have entered our study with different thresholds) and (b) products. The mean percentage of choices each participant recalled accurately was 80.81% (SD = 11.39%).

As predicted, the main results from Study 1 yielded a significant, inverse relationship between mean difficulty and recall accuracy ($b = -2.68$, $SE = 1.02$, $p < 0.01$). For each individual choice alternative, participants are less likely to remember it accurately when it came from a choice that was more difficult to make (see Figure 1).

Did the ratings of the two items in a pair determine the accuracy with which the decision was recalled?

To examine whether the rating of the products in the pair predicted recall accuracy, we fit a generalized linear mixed model to our data in R using the lme4 package. The dependent variable was the

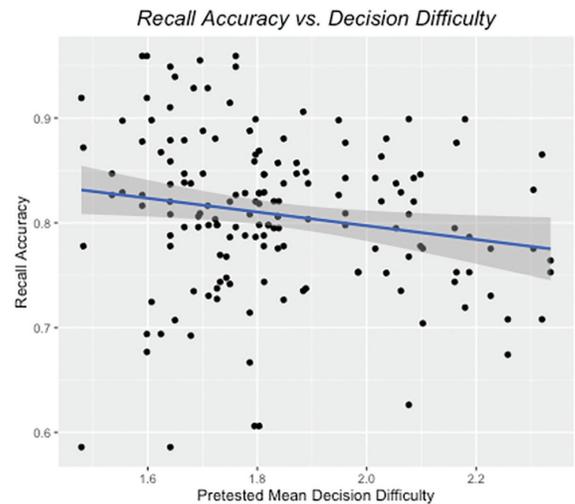


Fig. 1. Results for Study 1. shows the relationship between the difficulty of the decision a product was in and the recall for that product across all participants who saw it. The x axis shows the mean decision difficulty, and the y axis shows the recall accuracy for each product.

accuracy with which each decision was recalled. The independent variable was the mean pair-liking, as was determined in Pretest 1b. We included mean pair-liking as a fixed effect in our model. As random effects, we included intercepts for (a) participants (who may have entered our study with different thresholds) and (b) products. A significant, inverse relationship was found between mean pair-liking and recall accuracy ($b = -0.91$, $SE = 0.34$, $p < 0.01$). For each individual product, participants were less likely to remember it accurately when it came from a pair in which products were, on average, rated highly.

Did the relationship between decision difficulty and reduced recall accuracy depend on the closeness in ratings of the two items in the pair?

To examine whether, in predicting recall accuracy, there was a significant interaction between decision difficulty and pair liking gap, we fit a generalized linear mixed model to our data in R using the lme4 package. This model answers whether the association between decision difficulty and recall accuracy depends on the size of the liking gap between the two products. The dependent variable was the accuracy with which each decision was recalled. The independent variables were (a) mean rating of decision difficulty and (b) the liking gap between the two items in the pair, as well as (c) the interaction between these two variables. We included mean decision difficulty and mean liking gap (and the interactions between them) as fixed effects in our model. We included as random effects, intercepts for (a) participants (who may have entered our study with different thresholds) and (b) products. The interaction was not statistically significant ($b = 0.06$, $p = 0.73$).

Study 1 Discussion

The first study examined whether recall accuracy is better for hard decisions or easy decisions between products. Results supported our first and second hypotheses, that recall was worse for more difficult decisions, both overall and after controlling for the type of product. We also found support for our hypothesis that decisions between pair-items that are liked to a similar degree are more difficult to make and have lower recall accuracy as compared to decisions in which one item is liked significantly more than the

other. These results make intuitive sense. If one product in a pair is liked much more than the other, the decision-maker will likely not have a hard time choosing that product. If the products are liked to a similar extent, however, the decision-maker is not clearly drawn to one product over the other and will likely face a more difficult decision when choosing just one.

We also examined whether the magnitude of the association between decision difficulty and recall accuracy depended on how much the products in the pair were liked, yet the results were not significant. This means that regardless of whether the products were well-liked or disliked, more difficult decisions were recalled with lower accuracy. We also assessed whether, in predicting recall accuracy, there was an interaction between decision difficulty and the liking gap between the products in the pair. The results were similarly not significant; regardless of the size of the liking gap, more difficult decisions were recalled with lower accuracy. This analysis suggests that there is more to making a decision difficult – and hard to remember – than just how close together liking is for the two options in the pair.

Yet on its own, Study 1 does not confirm that decision difficulty is responsible for the decrease in recall accuracy for difficult pairs. Although difficulty is one possible explanation for the low recall accuracy, it is not the only one. It is also possible that participants were following a ‘liking heuristic.’ That is, during the recall task, rather than attempting to recall which products they actually chose in the choice task, participants may have simply applied a rule of thumb that they probably chose the products they liked. So then, when they were shown items that they liked during the recall task, they simply claimed they chose them before. This ‘liking heuristic’ could be less accurate for more difficult decisions. For instance, someone could be given an easy choice between products (e.g., a brand new sweater or a pack of dryer sheets) and a hard choice between products (e.g., a clothes hanger or a shoe-lace string). When shown each item individually in the recall task, if participants just claim they chose the items they liked the most, they would accurately claim having chosen the sweater from the easy pair more often than accurately claiming that they chose whichever item they picked from the difficult pair. As our analysis from Pretest 1b suggests, more difficult decisions are those in which the pair items are liked to a similar extent as one another. If both products in the difficult pair are disliked, participants could get the recall task wrong by saying that they did not choose either product, or if both products in the difficult pair are liked, participants could claim they *did* choose both of them. Therefore, if participants are simply using a ‘liking heuristic,’ they would more often answer the recall task correctly for the easy decisions than for the difficult decisions, even if they aren’t actually using their memory.

Study 2

In this study, we examined a possible alternative explanation to our primary hypothesis that memory is worse for more difficult decisions. Specifically, this study assessed the ‘liking heuristic hypothesis,’ that participants were simply selecting the items they liked as opposed to remembering which items they had previously chosen. To assess this alternative explanation, we tested whether the relationship between decision difficulty and recall held for choices between unpleasant options; specifically, pairs of bad-tasting jelly beans. During this recall task, participants were not able to simply select the options they like and infer that they would have chosen

them before, because participants presumably did not like *any* of the disliked flavors. If the only reason participants had lower recall accuracy for difficult decisions in Study 1 was because they selected the items that they liked in the recall task, then, for Study 2, in which all items are disliked and participants are not able to do this, we would not expect the same results. If choice amnesia is not found among disliked pairs, this would suggest that recall accuracy was worse for difficult decisions because, for these decisions, it is more challenging to use the ‘liking heuristic.’ However, if, as hypothesized, Study 2 shows lower recall accuracy for difficult decisions between disliked items, that would suggest that participants are in fact relying on their memory, and that poor memory for difficult decisions accounts at least in part for the decrease in recall accuracy.

It is important to note, however, that even among unpleasant options, some items may be disliked more than others (e.g., someone might not like the taste of eggplant but *hate* the taste of earwax). Therefore, when shown a pair of eggplant- and earwax-flavored jelly beans in the recall task, the participant may use the ‘liking heuristic,’ claiming that they previously chose eggplant only because it is better than the other disgusting options. In order to preclude participants from simply choosing the less disliked options, we could include mixed pairs in which one jelly bean comes from the liked domain and one comes from the disliked domain. With the inclusion of these mixed pairs, if, during the recall task, participants see an option from the disliked domain that is good compared to other disliked options, they cannot simply assume they would have chosen it, given that it could have originally been paired with a flavor from the liked domain. Therefore, if results show that difficult pairs of disliked items are recalled worse than easy pairs, this association would likely be due to a difference in memory rather than a difference in the accuracy of the ‘liking heuristic’ for easy versus difficult decisions.

Study 2 Methods

For Study 2, we used the basic design of Study 1, except that instead of showing participants pairs of consumer products, we showed them pairs of jelly bean flavors. We used jelly beans because it is a product for which both pleasant and unpleasant options exist – pleasant flavors can be found in typical stores, and unpleasant flavors are sold by brands such as BeanBoozled® or Harry Potter. As was confirmed by a pretest, twenty of the jelly bean pairs we assembled contained two pleasant flavors, twenty pairs contained two unpleasant flavors, and twenty pairs contained one pleasant and one unpleasant flavor. We used a mixture of existing jelly bean flavors as well as supposed flavors that were “created” for the study. Each flavor had a name and an image, some of which were real and some we created. The liked domain of jelly beans includes flavors such as bubblegum, very cherry, and mint chip, and the disliked domain includes flavors such as garbage, anchovies, and horse manure (see Appendix B for a complete list).

Different sets of U.S. adult participants were recruited through Amazon’s MTurk for each of Pretest 2a, Pretest 2b, and Study 2. In Pretest 2a, participants (N = 183, 44% male, Mage = 38.56) completed a choice task in which they chose between two jelly beans in a pair. After each choice, they rated how difficult the choice was to make. In Pretest 2b, participants (N = 213, 51% male, Mage = 38.31) were shown the same jelly bean pairs, yet instead of choosing between them, they rated each of the jelly beans on a scale of 0 to 100. In Study 2, participants (N = 301, 50% male, Mage = 39.11)



Body Odor

When you saw this jelly bean before, did you choose it?

Yes

No

Image 2. Recall Task for Study 2. A single jelly bean is presented and participants are asked whether they previously chose it during the choice task.

completed the same choice task as Pretest 2a, but after a one-minute distraction task, they were given a recall task in which they were tested for how well they recalled the choices they previously made (see Image 2). Identical to Study 1, in this recall task, jelly beans were presented individually so that participants would not be able to simply re-choose between the two items in the pair. Pretest 2a results found that among the liked pairs, there was very little variability in decision difficulty; all decisions between two liked jelly beans were rated as similarly easy to make. As a result, these liked pairs were removed from the main study and analysis below.

A potential limitation of the Study 2 design is that although participants could not select items they like, they could still select items they like *most*. That is, even though participants likely would not choose to eat any of the unpleasant flavored jelly beans, they may prefer eating some flavors more than others. During the recall task, they could potentially still use the ‘liking heuristic’ to infer that they would have chosen these flavors before. This is partially controlled for, though, by the fact that mixed pairs are included. With the mixed pairs included, participants cannot assume they would have chosen the unpleasant flavors they dislike the least given that if it came from a mixed pair, the participant likely would have chosen the *pleasant* flavor from that pair. Perhaps even more importantly, though, the results from the pretests suggest that none of the unpleasant flavors are liked significantly more than others. As can be seen in Figure 2, the disliked jelly bean flavors (shown in red) were all similarly disliked. Given that the range of liking for these disliked pairs is so minimal, participants were not able to see an item in the recall task and assume that they had chosen it before just because it was better than the other disliked options.

Study 2 Results

Did the difficulty of the decision affect the accuracy with which the decision was recalled?

To examine whether the difficulty of a choice between disliked items predicted recall accuracy, we fit a generalized linear mixed model to our data in R using the lme4 package. The dependent variable was the accuracy with which each decision was recalled. Recall for a particular jelly bean flavor was accurate if participants correctly recalled choosing the item or correctly recalled not choosing the item. The independent variable was the mean rating of decision difficulty, as was determined in Pretest 2a. We included mean decision difficulty as a fixed effect in our model. As random effects, we included intercepts for (a) participants (who may have entered our study with different thresholds) and (b) jelly bean flavors. As

predicted, the main results yielded a significant, inverse relationship between mean difficulty and recall accuracy ($b = -2.44$, $SE = 0.77$, $p < 0.01$). Among these disliked pairs, for each individual item, participants were less likely to accurately remember what choice they made when the decision was difficult to make compared to when it was easy (see Figure 3).

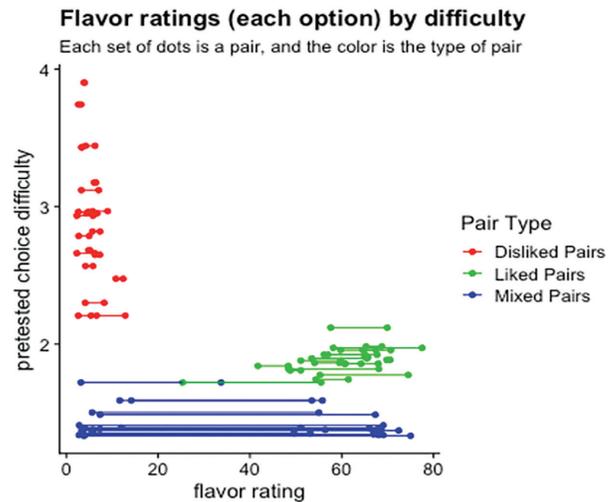


Fig. 2. Results for Study 2. In this graph, each dot represents a single jelly bean flavor, connected by a line to the other flavor in the pair. The graph shows the relationship between flavor rating and the difficulty of choosing between the flavors in the pair. The x axis shows the flavor rating, and the y axis shows the difficulty of the choice. Disliked pairs are shown in red, liked pairs in green, and mixed pairs in blue.

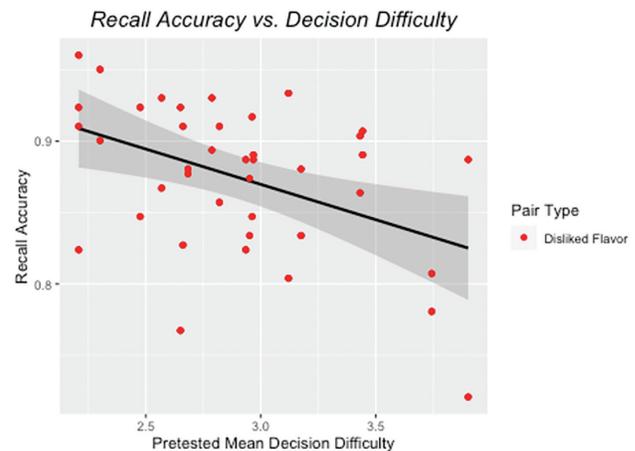


Fig. 3. Results for Study 2. In this graph, each dot represents a single jelly bean and shows, across all participants who viewed it, the relationship between the mean difficulty of making the decision involving that jelly bean and the mean accuracy as to whether it was chosen. The x axis shows the decision difficulty, and the y axis shows the recall accuracy for each jelly bean. Only the disliked pairs were included.

Did the relationship between decision difficulty and reduced recall accuracy depend on the closeness in ratings of the two items in the pair?

To examine whether, in predicting recall accuracy, there was a significant interaction between decision difficulty and pair liking gap, we fit a generalized linear mixed model to our data in R using the lme4 package. In other words, this model assessed whether the association between decision difficulty and recall accuracy depended on the size of the liking gap between the two items in the pair. The dependent variable was the accuracy with which each decision was recalled. The independent variables were (a) mean

rating of decision difficulty and (b) liking gap between the two items in the pair, as well as (c) the interaction between these two variables. We included mean decision difficulty and mean liking gap (and the interactions between them) as fixed effects in our model. We included as random effects, intercepts for (a) participants (who may have entered our study with different thresholds) and (b) jelly bean flavors. This interaction was also not statistically significant ($b = -0.09, p = 0.84$).

Study 2 Discussion

The results of this study support Hypothesis 3, that, among disliked pairs, recall is worse for difficult decisions than for easier ones. The fact that these results were found among disgusting jelly bean choices demonstrates that participants did not simply have higher recall accuracy for easier decisions because they could claim they chose the items they like. The results suggest that, instead, poor memory – or choice amnesia – accounts for the lower recall accuracy for difficult decisions.

Support was also found for Hypothesis 4, that decisions between pair-items that are liked a similar amount are more difficult to make and harder to recall than are decisions in which the liking gap between the two items is larger. Although each jelly bean came from the “disliked” domain, if one jelly bean in a particular pair was liked much more than the other, it would likely be a relatively easy decision to choose that item. If the choice alternatives are disliked to a similar extent, though, there would not be a clear choice and the decision would presumably be more challenging.

General Discussion

This thesis explores the relationship between decision difficulty and memory, specifically examining whether difficult decisions between products are remembered less-well than easier ones. Study 1 demonstrated that recall accuracy is lower for more difficult decisions between products, and Study 2 tested – and did not find support for – the alternative explanation that these results were only found because participants in the recall task selected the items they liked the most and therefore thought they would have chosen. The fact that people may have trouble remembering their previous choices, particularly those that were difficult to make, has important implications for consumer decision-making and purchasing behaviors. In order to use previous decisions to help guide current purchasing behavior, consumers must first remember what decisions they have made. Consumers – and the businesses that serve them – may rely on the assumption that they will be able to remember their past product decisions. This thesis suggests, however, that this is not always the case. Perhaps, then, both consumers and businesses could benefit from more attention and marketing dollars being directed at reminding consumers of the decisions they have already made.

It is interesting to note that, although difficult decisions likely involve more effort, in our study, this increased effort did not translate to better memory. If, during the recall task, participants had instead been asked, “did you decide between this pair during the choice task?” it is possible that they would have had better memory for the pairs that were more difficult to decide. Levari and Norton’s unpublished studies (2019) found this result for decisions between colors; for difficult pairs, people remembered that they were faced with two particular options, they were just worse at remembering which one they ultimately chose. Difficult choices likely take more

time and cognitive attention, and therefore, perhaps, people would have better memory for the fact that they decided between the two particular options in the pair. Yet remembering choosing between two products is different from remembering which product you chose.

Perhaps part of what makes difficult decisions more effortful is that, in coming to a final choice, the decision-maker actively contemplates choosing each option. If both options are considered, then, when the individual is later trying to recall their decision, they may have more trouble remembering which one they eventually chose. For instance, if someone who likes pasta much more than salad is choosing between items on a menu, then when later asked to recall which item he ordered, he will likely easily remember that he chose the pasta. Yet if he likes pasta and pizza similar amounts and has to actively contemplate choosing each one before coming to a decision, then when later asked what decision he made, he will likely have a harder time remembering.

Perhaps another psychological mechanism responsible for this choice amnesia, and a reason why it could be an adaptive strategy, is cognitive dissonance reduction. Individuals may be motivated to reduce the dissonance that is created by making a difficult decision and forgetting their difficult choices may be one effective way to do so. Other cognitive dissonance reduction strategies include post-hoc rationalization and spreading apart of the value of choice alternatives. Yet rather than going through the effort of justifying their decisions, perhaps in some situations, a more adaptive (although unconscious) strategy is to simply forget about the decision altogether.

Limitations and Future Directions

The present study contains several limitations that could be addressed in future research on choice amnesia. One such limitation is that different sets of participants completed the pretests determining decision difficulty and the main studies assessing recall. Although certain decisions are likely substantially more difficult than others, people’s personal opinions about which product decisions were difficult are likely somewhat varied. It would be helpful in future studies to use a single group of participants in order to examine whether the same people who find a particular decision difficult actually have a harder time remembering what choice they made.

Another limitation is that the range of difficulty of all the decisions in the study only spanned from 1.48 to 2.34 on a scale from 1 to 5. It is possible that the relationship between decision difficulty and recall accuracy is different outside this restricted range. For instance, we have suggested that extremely difficult decisions (i.e., those rated close to 5 on this scale) will be remembered with the lowest accuracy. But perhaps that is not so; it could be that for these decisions, the immense difficulty would lead to superior memory as compared to only semi-difficult decisions. Future studies should attempt to create a set of decisions with a wider range of difficulties, so as to assess whether the relationship found in this study holds for extremely easy or extremely difficult decisions.

Additionally, there are undeniable differences between the decision-making scenarios presented in these studies and real-life decisions between products. First of all, the amount of time between the choice task and recall task in these studies was very short. Future studies on choice amnesia should examine whether similar results are found when the period between choice and recall is greater,

perhaps by several days or weeks. Additionally, when consumers make decisions between products, they typically have the experience of using the selected product before they are back in a position in which they need to decide between products again. Surely, the experience of using the product could affect one's memory for what decision they made before. It is likely that recall accuracy would be substantially higher when people are given the opportunity to use the product, yet perhaps the results would still hold that recall accuracy would be worse for difficult decisions than for easier ones.

It is also important to note that different types of decisions leave different amounts of residual evidence of the decisions after they have been made. For instance, when an individual chooses a salad dressing at a restaurant, they use it and it disappears almost immediately along with any evidence of what choice was made. In contrast, other decisions lead to ownership of the chosen item, which creates more or less enduring evidence of the choice. A shampoo bottle may last for weeks and a mug may last for years. It is possible that one's ability to recall what decision they made is moderated by whether this behavioral residue exists. Perhaps, for instance, the relationship between decision difficulty and recall accuracy would be weaker for products that one still owns given that the residual evidence of the decision could overpower any impact of decision difficulty on recall accuracy. Future studies in which participants are given the opportunity to use these different types of products would shed light on this possibility.

An important next step for choice-amnesia research is to conduct studies that employ real-world purchasing scenarios. For instance, at a convenience store, participants could be asked to make various decisions among products and could be able to keep the items they selected from each pair. At a follow-up appointment, their memory for the products they chose could be tested. This study design would more closely replicate the experience of deciding among products and would also address some of the limitations of the current study; namely, there would be a longer break between choice and recall, participants would have the opportunity to use the products they chose, and the same participants who stated decision difficulty would complete the recall task.

Conclusion

The findings of this thesis offer key additions to the existing research on decision difficulty and recall accuracy. Consumers are frequently put in positions in which they would benefit from remembering their past choices – e.g., “Last time I went to the store, did I choose Crest or Colgate toothpaste? At Chipotle, did I order barbacoa or steak in my burrito? When I bought Nike shoes, did I decide on size 7 or 8?” Without knowledge of this study's findings, sellers may erroneously assume that consumers will have better memory for more difficult decisions, perhaps because making these decisions typically requires greater time and cognitive effort. Consumers may like to think that their product decisions are well-informed and are guided by their knowledge of their past purchasing behaviors. Yet when a previous choice was difficult to make, consumers' ability to remember their decisions and apply those past experiences to their current product decisions seems to be impaired. While future studies are needed to demonstrate the choice-amnesia effect in the context of real-world product decisions, the studies presented in this paper offer preliminary evidence of a perhaps counterintuitive inverse relationship between decision difficulty and memory. Basing current purchasing behaviors on

past product decisions could be a helpful way of reducing the effort involved in making such decisions. Yet in order to do so, people must first remember the choices they have made. Ironically, the decisions that require the most effort and that consumers would most benefit from remembering are precisely the ones they're more likely to forget.

References

- Anderson, M. C., & Levy, B. J. (2009). Suppressing unwanted memories. *Current Directions in Psychological Science*, 18(4), 189-194.
- Anderson M.C., Huddleston E. (2012) Towards a Cognitive and Neurobiological Model of Motivated Forgetting. In: R.F. Belli (Eds), True and false recovered memories: Nebraska symposium on motivation (pp.53-120). Springer.
- Ashton, S., Benoit, R. G., & Quaedflieg, C. W. (2020). The impairing effect of acute stress on the intentional forgetting of future fears and its moderation by working memory capacity. *PsyArXiv*. <https://doi.org/10.31234/osf.io/2am65>
- Bates, D., Mächler, M., Bolker, B., Walker S. (2015). Fitting linear mixed-effect models using lme4. *J. Stat. Softw.* 67, 1–48
- Benoit, R. G., Davies, D. J., & Anderson, M. C. (2016). Reducing future fears by suppressing the brain mechanisms underlying episodic simulation. *Proceedings of the National Academy of Sciences*, 113(52), E8492-E8501.
- Benton, S. L., Glover, J. A., Monkowski, P. G., & Shaughnessy, M. (1983). Decision difficulty and recall of prose. *Journal of Educational Psychology*, 75(5), 727-742.
- Bower, G. H., & Glass, A. L. (1976). Structural units and the redintegrative power of picture fragments. *Journal of Experimental Psychology: Human Learning and Memory*, 2(4), 456-466.
- Brehm, J. W. (1956). Postdecision changes in the desirability of alternatives. *The Journal of Abnormal and Social Psychology*, 52(3), 384-389.
- Chance, Z., & Norton, M. I. (2007). Decision amnesia: Motivated forgetting of difficult choices [Unpublished manuscript]. Harvard Business School, Harvard University.
- Depue, B. E., Banich, M. T., & Curran, T. (2006). Suppression of emotional and nonemotional content in memory: Effects of repetition on cognitive control. *Psychological science*, 17(5), 441-447.
- Elliot, A. J., & Devine, P. G. (1994). On the motivational nature of cognitive dissonance: Dissonance as psychological discomfort. *Journal of Personality and Social Psychology*, 67(3), 382-394.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.
- Gerard, H. B. (1967). Choice difficulty, dissonance, and the decision sequence. *Journal of Personality*, 35(1), 91-108.
- Henkel, L. A., & Mather, M. (2007). Memory attributions for choices: How beliefs shape our memories. *Journal of Memory and Language*, 57(2), 163-176.
- Jacoby, L. L., Craik, F. I., & Begg, I. (1979). Effects of decision difficulty on recognition and recall. *Journal of Verbal Learning and Verbal Behavior*, 18(5), 585-600.
- Janis, I. L., & Mann, L. (1976). Coping with decisional conflict: An analysis of how stress affects decision-making suggests interventions to improve the process. *American Scientist*, 64(6), 657-667.
- Janis, I. L., & Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice, and commitment*. Free Press.
- Klein, L. S., & Arbuckle, T. Y. (1970). Response latency and task difficulty in recognition memory. *Journal of Verbal Learning and Verbal Behavior*, 9(4), 467-472.
- Kouchaki, M., & Gino, F. (2015). Dirty deeds unwanted: The use of biased memory processes in the context of ethics. *Current Opinion in Psychology*, 6, 82-86.

- Kouchaki, M., & Gino, F. (2016). Memories of unethical actions become obfuscated over time. *Proceedings of the National Academy of Sciences*, 113(22), 6166-6171.
- Levari, D.E. & Norton, M.I. (2019). Choice Amnesia: When difficult choices are harder to remember [Unpublished manuscript]. Harvard Business School, Harvard University.
- Levy, B. J., & Anderson, M. C. (2008). Individual differences in the suppression of unwanted memories: The executive deficit hypothesis. *Acta psychologica*, 127(3), 623-635
- Lieberman, M. D., Ochsner, K. N., Gilbert, D. T., & Schacter, D. L. (2001). Do amnesics exhibit cognitive dissonance reduction? The role of explicit memory and attention in attitude change. *Psychological Science*, 12(2), 135-140.
- Lind, M., Visentini, M., Mäntylä, T., & Del Missier, F. (2017). Choice-supportive misremembering: A new taxonomy and review. *Frontiers in psychology*, 8, 2062.
- Luce, M. F., Bettman, J. R., & Payne, J. W. (1997). Choice processing in emotionally difficult decisions. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 23(2), 384-405.
- Mann, L., Janis, I. L., & Chaplin, R. (1969). Effects of anticipation of forthcoming information on predecisional processes. *Journal of Personality and social psychology*, 11(1), 10-16.
- Mather, M., Shafir, E., & Johnson, M. K. (2003). Remembering chosen and assigned options. *Memory & Cognition*, 31, 422-434.
- McClelland, G. H., Stewart, B. E., Judd, C. M., & Bourne Jr, L. E. (1987). Effects of choice task on attribute memory. *Organizational Behavior and Human Decision Processes*, 40(2), 235-254.
- McEwen, B. S., & Morrison, J. H. (2013). The brain on stress: vulnerability and plasticity of the prefrontal cortex over the life course. *Neuron*, 79(1), 16-29.
- Novemsky, N., Dhar, R., Schwarz, N., & Simonson, I. (2007). Preference fluency in choice. *Journal of marketing research*, 44(3), 347-356.
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1988). Adaptive strategy selection in decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 14(3), 534-552.
- Payne, J. W. (1976). Task complexity and contingent processing in decision making: An information search and protocol analysis. *Organizational behavior and human performance*, 16(2), 366-387.
- Qin, S., Hermans, E. J., van Marle, H. J., Luo, J., & Fernández, G. (2009). Acute psychological stress reduces working memory-related activity in the dorso-lateral prefrontal cortex. *Biological psychiatry*, 66(1), 25-32.
- R Core Team, R: A language and environment for statistical computing (R Foundation for Statistical Computing, Vienna, Austria, 2016; <http://www.r-project.org/>).
- Shenhav, A., & Buckner, R. L. (2014). Neural correlates of dueling affective reactions to win-win choices. *Proceedings of the National Academy of Sciences*, 111(30), 10978-10983.
- Shepard, R. N., & Podgorny, P. (1978). Cognitive processes that resemble perceptual processes. In W. K. Estes (Ed.), *Handbook of learning and cognitive processes*, vol. 5. (pp. 189-237). Lawrence Erlbaum Associates.
- Shultz, T. R., Léveillé, E., & Lepper, M. R. (1999). Free choice and cognitive dissonance revisited: Choosing "lesser evils" versus "greater goods". *Personality and Social Psychology Bulletin*, 25(1), 40-48.
- Stramaccia, D. F., Meyer, A. K., Rischer, K. M., Fawcett, J. M., & Benoit, R. G. (2020). Memory suppression and its deficiency in psychological disorders: A focused meta-analysis. *Journal of Experimental Psychology: General*.
- Tyler, S. W., Hertel, P. T., McCallum, M. C., & Ellis, H. C. (1979). Cognitive effort and memory. *Journal of Experimental Psychology: Human Learning and Memory*, 5(6), 607-617.
- Weaver, G. E., & Stanny, C. J. (1978). Short-term retention of pictorial stimuli as assessed by a probe recognition technique. *Journal of Experimental Psychology: Human Learning and Memory*, 4(1), 55-65.
- Zhou, J., Sun, J., Chen, F., Wang, Y., Taib, R., Khawaji, A., & Li, Z. (2015). Measurable decision making with GSR and pupillary analysis for intelligent user interface. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 21(6), 1-23.

One Man, Three Histories: An Analysis of the Impact of Presentist Histories on 19th Century Vaccination Debates

Rosie Poling
Harvard College '21

To understand the role of history in crafting health policy, this paper analyzes a historicist debate that played out in the late 19th century over “father of vaccination” Edward Jenner and compulsory vaccination laws. Between 1888 and 1896, the Royal Commission on Vaccination Laws heard arguments from a variety of perspectives. Within this time, three different histories of Jenner were published. Despite using the same primary sources, they came to different conclusions on who Jenner was. The *British Medical Journal*’s account portrayed Jenner as a hero, upholding both his scientific credibility and personal credibility. Edgar Crookshank, an anti-vaccinator who was also a professor of bacteriology, emphasized Jenner’s failing as a scientist as a reason both Jenner and vaccination should be rejected. Another anti-vaccinator, William White, constructed a version of Jenner that was selfish and suggested that his invention could therefore not be trusted. Ultimately, the *BMJ*’s account was effective at reaching policymakers while White’s narrative influenced the public. Through this analysis, the role of presentism in health policy can be understood to be influential.

Introduction

Is history relevant to health policy? This question dominates discussions among historians today, with a variety of perspectives on the value of history when discussing COVID-19 vaccination policies. Some argue for historicism, emphasizing that impartiality and disinterest are crucial to the production of history, citing how initial comparisons of COVID-19 to the 2003 SARS epidemic handicapped the response by not taking asymptomatic spread into account. Others argue that it is crucial to take a presentist approach, emphasizing that history is written to be meaningful to the living and there is much we can learn from analyzing common threads in all pandemics (Jones, 2020; Steinmetz-Jenkins, 2020). Some of the justification for social distancing measures came from a study from the 1918 influenza, demonstrating that shutting down sooner lead to a decreased death toll (Strochlic & Champine, 2020). There seems to lack a consensus on what role, if any, history should play in the policymaking or policy evaluation processes.

In perhaps a paradoxical fashion, this paper will explore how a presentist approach to history was used to justify different policies around vaccination in the late 19th century, specifically narratives about “the father of vaccination” Edward Jenner. In this case, presentism is defined in opposition to historicism. Presentism interprets the past with reference to the present, while historicism attempts to be entirely objective. Looking at three separate historical constructions of Jenner written ninety years after his first vaccination, I hope to understand how historical arguments were understood to be relevant to the policy debates about compulsory vaccination. My argument will begin by exploring the legislative context and the authors’ proposed policies around vaccination. Then, I will examine how they used historical evidence to construct narratives of Jenner’s life that supported their policies. Finally, I look at their own evaluations of the role history plays in policy arguments and how their narratives impacted the policy that was eventually developed. Analyzing their different legislative proposals and the different ways they represent Jenner provides a fascinating historical case study in presentism and policy that is applicable to the current moment.

Policy Aims of the Histories

Understanding the policy landscape that the sources were written in is crucial to understanding both their policies and histories. Edward Jenner popularized vaccination in 1796, but compulsory vaccination first became part of Parliament’s policy discussions in 1840, when they passed an act mandating that all infants had to be vaccinated within one month of life. Between 1840 and 1871, a series of acts were passed that tightened the enforcement of the law by creating Vaccination Officers and instituting harsher penalties for parents avoiding vaccinating their children. While statistics collected about the decline of smallpox prevalence supported this policy, those opposed to these laws (for a variety of reasons) began to organize and demand they be repealed. In 1888, Jacob Bright (a representative for Manchester in the House of Commons) introduced a repeal of the compulsory vaccination laws. Even though this repeal was defeated, a Royal Commission was set up to study the grievances of the anti-vaccinator community and receive input from the medical profession (Porter & Porter, 1988).

From 1888 to 1896, the Royal Commission on Vaccination Laws heard arguments on different policies from a variety of people. While all anti-vaccinators opposed vaccination laws, they had different reasons for being against vaccination and therefore proposed distinct policies in response (Porter & Porter, 1988). This essay will focus on three distinct historical stories of Jenner circulating between 1888 and 1896 that were used to argue for specific vaccination policies. This section will focus on understanding the biases of the “historians,” as well as their links to the health policy debate, before analyzing how and why they produced their versions of Jenner.

The narrative published first was written in 1885 by William White, a Swedenborgian bookseller who helped co-found the London Society for the Abolition of Complusory Vaccination (Porter & Porter, 1988). As the first editor of the “*Vaccination Inquirer*,” he published chapters of his book in various issues. While the readership of the “*Vaccination Inquirer*” likely included some medical experts and politicians, based off the correspondence section it was

mostly different factions of the public, especially working-class parents (London Society for the Abolition of Compulsory Vaccination, 1880). When White was alive, he was also active in petitioning the government. In 1883, he published a work entitled *"Sir Lyon Playfair taken to Pieces and disposed of: likewise Sir Charles W. Dilke, Bart: being a Dissection of their Speeches in the House of Commons on 19th June, 1883, in defense of Compulsory Vaccination."* In this work, he directly challenged their laws through his writing, and is praised for "effectually disposing of the plea for compulsory vaccination" (White, 1885). Although White died in 1885, his legacy as the "historian" for the movement was carried on by the way many in the public viewed the history of vaccination (Porter & Porter, 1988).

Without a scientific background, his 600-plus page account entitled "The Great Delusion" details his version of the history of vaccination without mentioning much scientific data. Directed to a public audience, his tone is often sarcastic and angry. In the preface, he writes that the laws of England compelled him to speak out on this topic, as by making it policy, vaccination was no longer a "private matter" (White, 1885). He attacked the notion that vaccination laws were purely a medical matter, as the public paid taxes and were subjected to the laws (Porter & Porter, 1988). He was not just concerned about governmental intervention, however, as his policy proposals were for complete repeal of any oppressive medical systems. Emphasizing doctors that benefited from vaccination, he believed that they could not be trusted to overturn the compulsory policies and it needed to be "overthrown from without" (White, 1885, pp. 584–585). He contends that "it would be as reasonable to expect slaveholders to denounce slavery ... as for those whose professional prestige and advantage are involved in the practice to speak the truth about vaccination." Comparing doctors to slaveholders, he attests that the problem is the system, not individuals working in the system. In his narrative, he sought to prove it was not just Jenner that was a "bad apple," the whole system was rotten. He did this by showing how Jenner was rewarded for negative character traits by the scientific community.

While Edgar M. Crookshank agreed with White on the need to repeal the vaccination acts, he believed the medical profession had a role to play. As the first professor of bacteriology at King's College London, his large two-volume study published in 1889 called "Vaccination, its history and pathology" was directed to his fellow "scientists" (Porter & Porter, 1988). In his preface, he writes that while he originally "accepted and taught the doctrines," he changed his view on vaccination when he was granted access to original materials about the history of Jenner. Through this history, he questions the link between smallpox and cowpox, as well as Jenner's scientific methodologies (Edgar March Crookshank, 1889). This volume was read by others in the medical profession, as shown by a review of it published in "The Journal of the Society of Medical Officers of Health" and references to it in the BMJ's centenary issue, but Crookshank's reach stretched further than that as well ("Jenner Centenary Number," 1896; "Professor Crookshank's Evidence before the Vaccination Commission," 1894a; "The Critical Inquiry. " of Edgar M. Crookshank, M.B.," 1890). Aside from various quotes in "Vaccination Inquirer" (a journal that reported anti-vaccination stories), he also testified for the Royal Commission's review of vaccination laws, citing evidence from his book ("Professor Crookshank's Evidence before the Vaccination Commission," 1894b). Specifically, in the hearing held by Lord Herschell, he advocated for the repeal of the vaccination laws and

replacement with a new system of prevention. While White would have been opposed to increasing the power of medical professionals, Crookshank proposes an international board of health that uses surveillance and quarantine to control spread of smallpox. Instead of vaccination, he advocates for sanitary methods to control disease spread (Edgar M. Crookshank, 1894). In this policy proposal, while doctors and scientists at-large are respected for their expertise, Jenner's vaccination theory was not considered valid. Therefore, in his narrative Jenner had to be portrayed as an outlier to the scientific community.

In response to these anti-vaccination policies and critiques of Jenner, on May 23rd, 1896, the British Medical Journal (BMJ) published the "Jenner Centenary Number" to celebrate 100 years since Jenner's first vaccination. The BMJ is known for scientific studies and was widely read by health professionals, but much of this issue focuses on Jenner's personal history, detailing what his family life was like and what kind of clothes he wore, while also praising him for saving lives ("Jenner Centenary Number," 1896). While there is no author in which the articles in this issue are attributed to, the editor at the time was known for being especially involved in advocating for vaccination. Ernest Hart was editor of the BMJ from 1866-1869, and again from 1871-1898. Under his leadership, he increased the British Medical Association from 2,000 to 19,000 members and increased the length of the BMJ from 20 to 64 pages, increasing the influence of the medical community. He wielded this prestige by being active in health policy debates, functioning as chairman of the British Medical Association's Parliamentary Bill Committee from 1872 to 1897 (Bartrip, 2004; Holmes, 1898). In 1880, he published a book called "The Truth About Vaccination" in which he refuted anti-vaccinator arguments, mainly using "modern" scientific data as opposed to historical arguments. In the preface, he explicitly addresses that he wrote the book for members of parliament who are "at their wits' ends to know where to find the true facts which these gentlemen (anti-vaccinators) delight to misrepresent" (Hart, 1880, p. v). While the bulk of Hart's arguments in this book are rooted in statistics and medical explanations, his work in publishing the BMJ issue celebrating Jenner demonstrates that he also thought that the early history was relevant.

This issue emphasizes the connection between history and current laws, as an article entitled "The Jenner Centenary: A Prophet Without Honor in His Own Country" is immediately followed by an article entitled "The Law as to Vaccination and Its Future." In this article, the BMJ editors argue for a policy of compulsory vaccination controlled by a central authority. They write that "never since vaccination came into operation has there been more convincing proof than is now available as to the necessity of a compulsory law as to vaccination..." demonstrating that they see the value that "modern" statistics gave them in arguing this point. They believe that for efficiency, uniformity, and safety reasons, a central authority should organize and inspect public vaccinators, as opposed to coordination within districts ("Jenner Centenary Number," 1896, pp. 1299–1301). Firm believers in scientific authority, they argue that these laws are necessary because "the public must be protected against itself" ("Jenner Centenary Number," 1896, p. 1290). To advocate for compulsory vaccination, they needed to craft a version of Jenner that was an upstanding scientist and respectable person that gained public trust.

All these individuals produced narratives of Jenner that they believed to be relevant to their policy proposals and as such their

portrayals of Jenner were very different. Crookshank, coming from a scientific background, emphasized Jenner's failings as a scientist while White emphasizes his selfishness and conceitedness to a public audience. The BMJ account of Jenner's life sought to refute both attacks by defending both Jenner's scientific credibility and character.

Evaluation of Evidence

One may question whether, in this context, history drove the creation of policy or the policies drove historical analysis. Despite their very different narratives in all these sources, both anti-vaccination and pro-vaccination accounts utilized many of the same sources, often including the same exact quotes, which leads one to believe that the policy creation happened first and biased their interpretation of history. A key common source was John Barron's two-volume "Life of Edward Jenner," published in 1823 and 1838. As a close personal friend of Jenner, Barron's account is described as "hagiographic" (a description of something that is holy) the Oxford Dictionary today (Brunton, 2004). Jenner is portrayed as hero who never received due credit and Barron refused to acknowledge any of Jenner's faults. It should come as no surprise that anti-vaccinator accounts believed his interpretation to be untrustworthy. White argues that the only use of Barron's biography is "as a collection of evidence" as he treats Jenner as "a sacred being" and refuses to seriously discuss any of Jenner's contemporary critics (White, 1885, p. 349).

Crookshank takes this argument a step further, and ties Barron's motives to more than just trying to defend his friend. Crookshank claims that "Barron's object was not merely to write a biography of Jenner; his work was intended to restore the shattered credit of vaccination" (Edgar March Crookshank, 1889, p. 446). He asserts that vaccination was on the decline until Barron's book was published, and that the book is full of "prejudice, strong biases... and gross fallacies" (Edgar March Crookshank, 1889, p. 446). Aside from critiquing Barron, this perspective clearly demonstrates the role that Crookshank believed the telling of history had in inciting health policy and motivates his writing an alternative version.

Perhaps surprisingly, the BMJ also agrees that Barron's work was biased, writing that Barron was "so great a worshipper of Jenner that his statements are sometimes warped by his affection for his friend" ("Jenner Centenary Number," 1896, p. 1252). However, while they acknowledge that Barron's depiction of Jenner as a saint goes too far, the BMJ also contends that the anti-vaccinator histories are biased by their contempt for Jenner's theory. By acknowledging both sides, the BMJ attempts to hold their ethos as a "via media" lying between both extremes ("Jenner Centenary Number," 1896, p. 1252). In trying to achieve this balance, they attempt to live up to the scientific value of impartiality. However, aside from admitting once that Jenner was clumsy, they largely focus on his positive traits, calling him a "prophet" at one point ("Jenner Centenary Number," 1896, pp. 1252, 1299).

While White, Crookshank, and the BMJ all saw flaws in Barron's history, their different revised versions were less about seeking the truth and more about supporting their vaccination policies. Even though both sides of this debate acknowledge that Barron's praise was too uncritical, they all used Barron as a source because he was bequeathed all of Jenner's notes and letters and provided personal anecdotes (Brunton, 2004). In this way, they all had to adhere to the same provided evidence. Despite these limits, they sought to

create three different life stories for Jenner that would support their policy views.

Three Histories of Jenner

Despite the restrictions to producing their histories, the contrasting aims of the "historians" lead to very different answers to the question: "who is Edward Jenner?" The authors included or excluded certain details that did not fit their narrative and speculated on why Jenner did or did not do something in dissimilar ways to mold Jenner into a character that supported their contemporary view on vaccination. This paper will not evaluate these stories to judge which is the "truth," but rather will explore what histories were used in the policy debates. As we will come to see, because Jenner was so associated with the theory of vaccination, attacking one meant attacking the other. Going chronologically through Jenner's life and comparing the different versions of Jenner created by the BMJ, Crookshank, and White provides insight into his role in health policy debates seventy years after his death.

Early Life and Education

All the sources agree that Edward Jenner was born on May 17th, 1749 in Berkeley and grew up interested in zoology and geology. His mentor, John Hunter, is described in all accounts, although the relationship described between them varies between narratives. John Hunter, along with his brother William, was a famous surgeon who founded an anatomy school that allowed students to dissect human corpses, emphasizing observation and experimentation as part of the learning process. Because he dissected 2,000 bodies over the course of 12 years, Hunter was regarded as an expert in the human body (Moore, 2009). The BMJ highlights this connection, devoting lots of space to describing their friendship. The source states "between master and pupil was an affection sprang up," and even include a quote about Hunter agreeing to be a godfather to Jenner's eldest son as proof of their close relationship ("Jenner Centenary Number," 1896, pp. 1246-1247). The BMJ paints Jenner as a respected member of the scientific community, as well as personally close with other scientific geniuses. Crookshank's anti-vaccinator accounts begrudgingly admit Jenner's connection with Hunter, but he tries to distance Hunter from Jenner by writing that Hunter did not "give the Experiment much credit" (Edgar March Crookshank, 1889, p. 213). By downplaying Hunter's relationship with Jenner, he creates doubt about Jenner's acceptance in the scientific community. On the other hand, White acknowledges the connection, writing that "Hunter's name (was) often used as a sort of consecration of Jenner," but he does not understand why the scientific community respected Hunter. White described how Hunter asked Jenner to supply improper and offensive things for his collections, including "the arm of a certain patient when he dies." He also argues that Hunter's letters were full of recommendations for "horrible experiments on hedgehogs, bats, and dogs, and ... one of special atrocity upon an ass" (White, 1885, pp. 92-93). While Crookshank respected Hunter, White did not and created a narrative that condemned the whole scientific community for their unethical experiments.

Inspiration and Experimentation

The narratives begin to diverge even more in their portrayal of Jenner's initial spark. The basic story begins when Jenner helped treat a young girl as an apprentice was to a surgeon in Sodbury. When smallpox was proposed as a possible cause of her ailment, she exclaimed, "I cannot take that disease, for I have had cowpox"

(Edgar March Crookshank, 1889; “Jenner Centenary Number,” 1896; White, 1885).

In the BMJ, this anecdote is painted as an epiphany moment and afterwards “the idea was ever constant in his mind.” By pinning his idea down to a single moment, Jenner is portrayed as a brilliant genius. They explain that he waited until 1780 to “impart it to others” because he wanted to wait until he felt “sufficient confidence” in the idea (“Jenner Centenary Number,” 1896, p. 1249). He told his friend and colleague Gardner about his idea, writing:

“Garner I have entrusted a most important matter to you, which I firmly believe will prove of essential benefit to the human race. I know you and should not wish what I have started to be brought into conversation, for should anything untoward turn up in my experiments I should be made, particularly by my medical brethren, the subject of ridicule, for I am the mark they all shoot at.” (“Jenner Centenary Number,” 1896, pp. 1249–1250)

By their use of this quote, the BMJ frames this discovery as a benefit to others, not himself. Additionally, the BMJ editors explain that his reluctance to share originally is motivated by a desire to make sure he was getting at the truth. The BMJ goes on to describe how after Jenner was unable to have his theory tested in London, he returned to Berkeley and spent 1788–1796 collecting data about the link between cowpox and smallpox. The first recorded vaccination on May 14th, 1796 involved taking matter from a dairymaid who had been infected with cowpox and putting it into a local 8-year-old boy named James Phipps (“Jenner Centenary Number,” 1896, p. 1249). This version of the description of his experiments highlights his determination and also shows that it wasn’t superstitious milk maids who are responsible for the idea, but rather trained doctors adhering to the medical community’s high standards of proof. This supports their policy argument that doctors should oversee the logistics of vaccination. In this narrative, Jenner and his theory of vaccination follow a logical progression of scientific thought, moving from observation to experimentation to find the truth.

Crookshank’s version of events brings in a different source that questions this narrative of Jenner’s diligent work. Citing Thomas Dudley Fosbrooke’s biography of Jenner published in 1821, he finds it strange that, despite the incident with the milk maid being described as an epiphany moment for Jenner in Baron’s text, there is no mention of it in Fosbrooke’s writing. Unlike the BMJ, which emphasizes Jenner’s diligence, he quotes Fosbrooke’s statement that during the time in-between the initial spark in Sodbury and 1780, Jenner was “not then burdened with the labours which vaccination (sic) has generated.” Instead, Crookshank’s version of Jenner devoted his time to poetry, gardening, and observing birds, not thinking about vaccination. Additionally, rather than describing Jenner’s life between 1788 and 1796 as full of “experimental inquiries,” he instead describes them as a series of unmethodical failures to inoculate people. Crookshank emphasizes how disorganized Jenner’s data collection tables were; at times, Jenner did not even record when he had inoculated people (Edgar March Crookshank, 1889, pp. 125–128). Crookshank presents the 1796 vaccination of James Phipps as not a result of Jenner’s great foresight and planning as a scientist, but rather as a random “opportunity” as cowpox was prevalent nearby. This account seeks to discredit the picture of Jenner as an observant scientist, putting his work outside that of the acceptable scientific practices. By discrediting vaccination, but not science, Crookshank’s narrative supports his policy proposal.

Diverging from Crookshank’s focus on science, White’s interpretation of this event emphasizes Jenner’s greed. White’s narrative focuses heavily on the difference between “spontaneous cowpox” (the type collected from other people’s sores) and “horsegrease cowpox” (cowpox that came from the diseased discharge on the heels of horses.) While White claims that Jenner originally accepted “the dairymaids’ faith” and advocated for spontaneous cowpox, the medical community ridiculed him and convinced him that spontaneous cowpox was not protective. White draws particular attention to this point, writing “No man knew better than Jenner that cowpox was not preventative of smallpox” because of the shame of being corrected by the medical profession (White, 1885, p. xiii). In White’s narrative, this is when Jenner shifted his focus from “spontaneous cowpox” to “horsegrease cowpox.” Jenner’s creation of these categories allowed him to publish his theory linking cowpox to protection against smallpox, finding that while “cowpox (had) no efficacy against smallpox, horsegrease cowpox (was) of sure efficacy” (White, 1885, p. xiv). According to White, Jenner recommended horsegrease cowpox in his original publication, “An Inquiry into the Causes and Effects of the Variolae Vaccinae.” However, other experiments to inoculate cows with this horsegrease cowpox did not work and it also sounded so disgusting that people rejected it immediately. White argues that other doctors convinced Jenner to go along with the transformation back to spontaneous cowpox because Jenner “saw how the wind was blowing” and knew he could make money off of vaccination by posing as “its discoverer and promoter” (White, 1885, p. xv). White emphasizes that this was a contradiction to his earlier work, sarcastically stating that “the dairymaids were right, and they were wrong” (White, 1885, p. xiv). This switch back is found in quotes from Jenner’s 1802 petition for funds from the House of Commons, in which Jenner claims that he discovered the use of inoculation with spontaneous cowpox. White remarks:

“Why, that was not Jenner’s discovery! It was the notion of the dairymaids, and, so far as concerned spontaneous cowpox, was known by Jenner to be untrue.” (White, 1885, p. xvi)

Jenner’s multiple switches between types of cowpox to be used in vaccination is interpreted as evidence that he was not concerned about truth, but rather money. Not only did he claim credit for something discovered by dairymaids, he also was promoting a practice that he knew did not work. While Crookshank described Jenner as an undedicated scientist, White’s account argues that Jenner’s disregard for truth was not mere disinterest but rather due to his greed. He also implicates the larger medical community in supporting Jenner’s multiple switches for the sake of profit, supporting his policy for complete freedom from medical interference.

Peer Review: Jenner as a Scientist

While White advocated for complete freedom from medical greed, the BMJ’s and Crookshank’s vaccination policies relied on building trust in the medical community. They understood that after Jenner’s experimentation and analysis of vaccination, the next step in the scientific process was peer review and publishing. This process looked very different in Jenner’s time. The main journal available for scientists was *Philosophical Transactions*, which was controlled by a committee from the Royal Society that voted on what to publish. These early review processes were more concerned about interesting content than evaluating quality of research (Csizsar, 2016). While primary sources show that while Jenner attempted to submit his

work to the Royal Society, it ended up not even being read there, so therefore it was not formally rejected (Banks, 2007). While White does not discuss this process, Crookshank and the BMJ describe very different interpretations in how Jenner engaged with them.

Crookshank states that Jenner's original manuscript on vaccination was rejected by the Royal Society in 1796. Using quotes from the original manuscript, Crookshank describes that Jenner only submitted ten cowpox cases and three horsegrease cowpox cases as proof of "the tradition of the dairymaids," describing how people who naturally had cowpox did not have smallpox later. He emphasizes that Jenner only used "ONE EXPERIMENT" (his capitalization) to show that a human could be inoculated with cowpox and later, when exposed to smallpox, not get infected. Crookshank mockingly writes "This he considers to be quite sufficient." He also believed it important to mention that someone else wrote over Jenner's original description of "discovery," replacing it with "investigation." He argues that Jenner did not discover anything, rather he speculated on little data. After this manuscript was rejected, Crookshank argues that Jenner went straight to self-publishing "Inquiry" because he feared a second rejection (Edgar March Crookshank, 1889, Chapter VII). This anecdote bolsters Crookshank's image of Jenner as a poor scientist whose speculations did not meet the standards of the scientific community.

Published seven years later, the BMJ directly responds to Crookshank's interpretation of the manuscript and its role in Jenner's story. They begin by casting doubt that the manuscript was even officially received by the Royal Society. They argue that a colleague showed Jenner's ideas informally and prematurely to the society, and because the theory at this time was "startling" and "founded on one experiment only," they state that it is no wonder that the society asked Jenner for more experiments. They also write "undoubtedly Jenner originally intended sending the paper to the Royal Society, although Worthington advised him that it would be better to publish it as a pamphlet," suggesting that his self-publishing was not out of a desire to avoid scrutiny, but rather advised by those in the profession. This portrays Jenner as a thoughtful scientist. Later, they write that "even if it could be shown conclusively that the Society did receive and reject the paper, the subsequent history of the work would prove, not that Jenner was wrong, but that the Council of the Society made a mistake in rejecting the paper." ("Jenner Centenary Number," 1896, p. 1257). This quote highlights the importance of tying their argument to the present, as even if Jenner's argument was rejected at first, it is widely accepted by the scientific community now. With faith in Jenner's idea, and therefore in Jenner himself, they seek to justify national medical control of compulsory vaccination.

Not only does the BMJ critique Crookshank's "anxious" focus on trying to prove Jenner was rejected, they also argue that Crookshank frequently misquoted Jenner in his analysis, swapping words like "malady" for "distemper" and using "for the same purpose" instead of "for the same manner" ("Jenner Centenary Number," 1896, p. 1257). Calling out these seemingly minor errors is part of their attempt to cast doubt on Crookshank's interpretation. They also disagree with Crookshank that someone else wrote over Jenner's original words, arguing that the handwriting is the same, so it is actually Jenner's correction. They even include a full-page copy of the letter and urge the reader to see for themselves if it looks different ("Jenner Centenary Number," 1896, p. 1259). The space the BMJ dedicates to refuting Crookshank, as well as the level of detail

in which they do, demonstrates that out of everything Crookshank wrote about Jenner that the BMJ disagreed with, Jenner's acceptance by the scientific community was something the BMJ could not let go unchallenged because of its relevance to their policy.

Peer Review: Jenner as a Man

After "Inquiry" was published, many critics and supporters alike interacted with the idea, and therefore with Jenner. White weighs the perspectives of those that disagreed with Jenner heavily in his estimation of his character, stating that "a sharp test of character is a man's disposition to his adversaries; and Jenner was never magnanimous" (White, 1885, p. 350). While he acknowledges that early anti-vaccinators discredited their cause with "scurrility and extravagance," he laments at the contempt by which Jenner treated his contemporary critics (White, 1885, p. 289). He quotes Jenner's description of several respected men who disagreed with him as "deadly serpents" spreading "venom" with their counterarguments (White, 1885, p. 361). With sympathy for these men, he writes that "there is the woeful monotony of truth in these old pamphlets... We recognise the narratives as true, for they are reproduced among us continuously by the same means, with the same miseries and agonies" demonstrating that he saw their "modern" movement as connected to their predecessors (White, 1885, p. 301). By drawing comparison between how Jenner treated his critics and how current medical professionals treated him and his fellow anti-vaccinators, White seeks to condemn the entire medical profession to support his repeal of vaccination policy. Aside from Jenner's treatment of anti-vaccinators, he also focuses on how Jenner acted spitefully and jealously to fellow supporters who challenged this claim to the theory of vaccination. For example, White discusses how Jenner treated London-based physicians Dr. William Woodville and Dr. George Pearson, who were inspired by Jenner's work to do more experiments. Despite White's claims that their experiments showed that cowpox was not protective, they began promoting the theory of vaccination themselves as "New Inoculation." White claims that this infuriated a glory-hungry Jenner, and as he "whined" to Baron, "It is impossible for me, single-handed, to combat all my adversaries. I am beset on all sides with snarling fellows, and so ignorant withal that they know no more of the disease they write about than the animals which generate it" (White, 1885, Chapter V). Referring to these men as "adversaries" creates an image of Jenner as a hostile and possessive peer, as he describes Jenner's treatment of them as "evil" (White, 1885, p. 188). White frames Jenner's inability to get along with his colleagues as a revealing part of his character and the larger problem of greed in the entire medical system, supporting his policy to lessen their control.

Crookshank adopts a similar narrative but frames Jenner's lashing out at critics and over-eager supporters as part of being a bad scientist. He quotes a letter in which Jenner wrote "There is not a single case, nor single argument, that puts the weight of a feather in the scale of the anti-vaccinist" (Edgar March Crookshank, 1889, p. 181). In Crookshank's view, a true scientist would at least listen to those that opposed them, but his quote shows a refusal to even consider anything they said. For Jenner's interactions with Woodville and Pearson, Crookshank quotes entire letters, drawing attention to Jenner's desire not for truth, but for glory. Crookshank argues that originally Jenner had stayed in the countryside because "he knew his theory would be rigidly tested in London and he was not prepared to face failures," but returned to London to defend his credit (Edgar

M. Crookshank, 1894, p. 142). As Woodville and Pearson vaccinated hundreds of people and sent cowpox matter internationally, Jenner's nephew George told Jenner to act, as "now is your time to establish your fame and fortune; but if you delay taking a personal active part any longer, the opportunity will be lost forever" (Edgar March Crookshank, 1889, pp. 149–160). Crookshank uses Jenner's immediate departure to London as proof of his true motives. He does not go to receive feedback like a "good" scientist, rather he goes to ensure the idea is attributed to his name. In this portrayal, Jenner is a doubtful scientist who opts-out of peer review but opts-in to receiving the credit, and therefore his idea should not be policy.

In the BMJ's history, they emphasize that those who opposed vaccination (and therefore opposed Jenner) did so on false grounds. For example, the article highlights that early anti-vaccinators were scared that the vaccine would cause cow horns would grow out of their heads, demonstrating the absurdity of their arguments and Jenner's justification in dismissing them. The BMJ highlighted that Jenner "anticipated" the critiques from other medical professionals who claimed that their vaccinated patients became sick with smallpox; Jenner responded by stating that they had incorrectly replicated the vaccination procedure ("Jenner Centenary Number," 1896, pp. 1250–1251). The BMJ's Jenner is calm and rational when responding to these criticisms. The names Pearson and Woodville do not appear at all in the BMJ's history of Jenner, as they censor out any squabbles he had with other scientists over credit. Instead, they list out (over the course of several pages) all the medals and honors he received, especially emphasizing his numerous honorary degrees from medical schools from all over the world ("Jenner Centenary Number," 1896, pp. 1258–1261). This list demonstrates a version of Jenner that was respected in the scientific community, and while not in pursuit of fame or fortune, was owed it because of his brilliance.

Compensation for His Discovery

After observation, experimentation, and communication, the next (unofficial) step in the scientific process is credit, and at times, compensation. On March 17th, 1802, Jenner submitted a petition to the House of Commons for a grant request and he received £10,000 in 1802 and £20,000 in 1807. Crookshank merely reprints the documents associated with this event without much analysis, only upset that these funds gave Jenner more "leisure to attend to his correspondence on the constant subject of failures" of vaccination (Edgar March Crookshank, 1889, p. 175). However, this event holds great weight in both the BMJ and White narratives as proof of his motives.

The BMJ frames the grant as resounding victory for Jenner, and therefore his science. They emphasize how much he deserved the money in exchange for his gift to the world. Asserting that "he has not only reaped no advantage from his discovery, but he has been a considerable loser by the preserving attention which he has bestowed upon this one subject to the neglect of his other business," they also use quotes from parliamentarians to claim that Jenner's focus on providing vaccination as a public good to the world meant his own finances suffered ("Jenner Centenary Number," 1896, pp. 1251–1253). The BMJ emphasizes again and again that while Jenner could have made lots of money off use of this "secret remedy," Jenner "never for a moment hesitated to whether he might not be a richer man by keeping this information to himself" ("Jenner Centenary Number," 1896, p. 1253). They also cite (and include a picture

of) his "Temple of Vaccina" in his backyard where he provided vaccination to the poor for free in Berkeley ("Jenner Centenary Number," 1896, p. 1254). This "temple" is not mentioned in either of the other narratives, but in the BMJ's story it seeks to show that the medical profession is willing to make great sacrifices for the good of the public.

Aside from using these testimonies to show Jenner's selflessness, the BMJ also appeals to the authority of the House of Commons for judgement on Jenner's character. The arguments amongst members of parliament were about how much money to give, not whether Jenner deserved it. Throughout the debates, "there is not a word to be found derogatory to Jenner's good name" ("Jenner Centenary Number," 1896, p. 1252). They interpret the lack of controversy about Jenner's approval for a grant as firm endorsement among "men of education" to his achievements. Through this event, the BMJ works to build up their image of Jenner (and by connection his science) as altruistic and widely respected.

White also details the discussion about Jenner's grant from Parliament, but with a very different interpretative lens. He attests that there was no controversy because opposition doctors did not have time to prepare, while Jenner's medical friends were enthusiastic and unfairly influential. White details the arguments of the members of parliament but not in the same proud way the BMJ did. Instead, he writes, "it was as if all had consented to go mad together" (White, 1885, Chapter X). His bewilderment at the praises of Jenner from the members of parliament casts doubt onto their judgement of character; they are not to be trusted either. Additionally, White takes care to make sure that this grant was labeled as public money, funded by taxes, in a time of "war and scarcity." He emphasizes that while Jenner was receiving £30,000, "times were dark and hard, cruelly hard, through war and scanty harvests; the quartern loaf selling at 1s. 11d., a significant index of the people's misery" (White, 1885, p. 196). In this narrative, Jenner's acceptance of this grant was not acting in a starving public's interests. By critiquing Jenner's prioritizing himself over the public, he attempts to show how vaccination laws do the same. Additionally, his critiques of Parliament's judgement to give such a lavish grant to an undeserving man demonstrate that they are also not to be trusted.

This anecdote describes why Jenner's story was so crucial to late 19th century debate about vaccination. To qualify for the grant, Jenner had to prove that he was the sole discoverer of vaccination. The BMJ argues that he secured this, as "the whole of the oral depositions, as well as all the written documents from abroad, are uniform and decisive in favor of Dr. Jenner's claim to originality in the discovery" ("Jenner Centenary Number," 1896, p. 1251). With this legacy in the official record, the presentist historians often evaluated him and his science together. He needed to be understood as good scientist and a good person for his work to be accepted and turned into policy. The disagreements in these narratives on how and why he developed his theory of vaccination casts doubt onto the science that was produced and what laws should be in place around his technology. Published after the other narratives, the BMJ's defense of Jenner had to address both Crookshank's emphasis on Jenner as a bad scientist and White's description of Jenner as a bad person to prove that vaccination was beneficial

Value of Historical Arguments in this Debate

The hundreds of pages written by the three above authors demonstrates that they saw the history of Jenner as relevant to their

present policy aims. The close association of Jenner to his theory meant that an attack on one meant an attack on the other, so it was necessary to construct a version of Jenner that fit their views on vaccination. However, despite dedicating an entire issue to the history of Jenner, the BMJ had reservations about using presentist history. Before discussing the evidence shown before the 1888 to 1896 Royal Commission on Vaccination, they describe their prioritization on looking at current statistics about vaccination efficacy. Agreeing with Sir John Simon, they argue “When I look at the question of vaccination, I look at it independently of the question of origins. I look at current vaccination”, emphasizing that the origins story, on its own, was not enough evidence (“Jenner Centenary Number,” 1896, p. 1293). Presenting this perspective inside a 67-page issue entitled “The Jenner Centenary Number,” this depreciation of history’s role seems contradictory. However, they clarify that they object not to the telling of Jenner’s successes, but rather to the use of historical statistics over current statistics on vaccine efficacy.

The BMJ’s view on the value of presentist history contrasted sharply with that of Crookshank and led to a lively debate between the two perspectives. In 1894, the BMJ published an article that critiqued Crookshank’s evidence presented before the vaccination commission. Arguing that “his evidence is largely historical, if such an uncriticized collection of paragraphs from old authors can be called history,” they dismiss it as irrelevant, claiming that while even if there was more uncertainty about vaccination in Jenner’s time, their new statistics and experiments proved that vaccination was beneficial (“Professor Crookshank’s Evidence before the Vaccination Commission,” 1894). Crookshank responded to this in the correspondence section of the BMJ, arguing that he purposefully gave “verbatim extracts” in his book because it was the strongest form of evidence and was important for understanding the entire vaccination question, maintaining that history had a role in health policy (Edgar M. Crookshank, 1894). This clash foreshadows the Royal Commission’s position on the use of history in deciding policy.

Even with their preference for scientific arguments, the BMJ’s historical arguments are (hesitatingly) present in their policy debates. In their narrative of Jenner, they are frequently on the defensive, trying to correct flaws in the other narratives. Despite history not being a priority, they saw a need for a pro-vaccinator history in a similar way that 21st century historian Jill Lepore believes that “If people who are cautious about evidence and argument and method refused to talk about the relationship between the past and the present, then the only people who will be doing that will be Glenn Beck, Sean Hannity, and Bill O’Reilly” (Steinmetz-Jenkins, 2020). In their case, if they did not write the history, then anti-vaccinators would.

Policy Outcomes

In 1896, after over seven years of deliberations with 136 meetings and 187 “witnesses” consulted, the Royal Commission released their policy recommendations in a 748-page book full of detailed notes, as well as tables and graphs. Several pages of this report detail elements of Jenner’s story. While they use non-emotional language and refrain from discussing any of his personal character traits, the Royal Commission’s version of Jenner is most like the BMJ’s, as they emphasize his scientific expertise and acceptance. While they discuss these early origins to answer what the theory was founded on, they emphasize that modern statistics are much more important in their conclusions. They acknowledge that while “much criticism has been applied to the writings of Jenner... and strenuous efforts

have been made to show that their observations cannot always be relied on” it does not matter for their modern-day conclusions considering the decades of research they now had. They write:

“If a study of this experience taught us that vaccination had not exercised any beneficial influence as a protection against small-pox... we could have no faith in vaccination... however accurate the observations of Jenner. If, on the other hand, the reasonable conclusion from more than half a century of vaccination, be that the vaccinated show less liability to attack by the disease of small-pox... these facts cannot be displaced by showing that Jenner ... erred in some respects in their observations and conclusions.”(*Final Report of the Royal Commission Appointed to Inquire into the Subject of Vaccination.*, n.d., p. 92)

Jenner was taken off the pedestal, but vaccination remained on it. This quote seems to show that they believe Jenner’s story to be irrelevant to the commission’s deliberations, but it shows that they attribute these errors to part of uncertainty in the scientific process, not to Jenner’s deception or poor aptitude towards science. This also demonstrates that the narratives pushed by Crookshank and White were not effective at causing the Royal Commission to doubt the current data that supported Jenner’s theory.

However, in the end, none of the policies advocated by the BMJ, Crookshank, or White were completely enacted. Eleven of the thirteen members of the commission ruled in favor of compulsory vaccination in a seeming “win” for the BMJ’s proposal. However, they left vaccination enforcement and logistics under the control of local authorities and proposed a conscientious objector clause, which was later passed in 1898. The conscientious objector clause, which allowed a parent to opt their child out of vaccination if they had a “sincere” reason and were not just being lazy, meant that the histories believed by the public took on a much bigger role in the realities of the vaccination law. Local magistrates had ultimate discretion, resulting in very different experiences of the law in different places. While in some places, parents appealing for vaccination exemptions were heckled, denied, or threatened, with one magistrate calling an objector “an enemy of the human race,” other places like Southwark, Keighley, and Heywood overcompensated and offered exemption hearings around working-man schedules. In these districts, vaccination decreased from 95% to 2% by the end of 1898.(Durbach, 2004, Chapter 8) This narrative of vaccination policy demonstrates the involvement of politicians, doctors, and the public in creating the realities of the legislation. While the BMJ’s narrative of Jenner was influential in supporting the Royal Commission’s conclusions, White’s story appealed to the public imagination and may have motivated many to opt out of vaccination. Many conscientious objectors cited desire for freedom from medical tyranny and greed as a reason why they opted out of vaccination, picking up on Whites’ major themes. While none of the histories or policies completely won, they certainly shaped the experiences of vaccination.

Conclusion

These three sources- the BMJ, Crookshank, and White- all brought their different perspectives to the same evidence, deriving very different meanings from Jenner’s life. Examining all stages of his scientific process, their narratives deal with the common threads of his methodologies and motives. Their different interpretations of Jenner as a hero or villain served their arguments about the efficacy of vaccination. While the BMJ expressed some qualms about

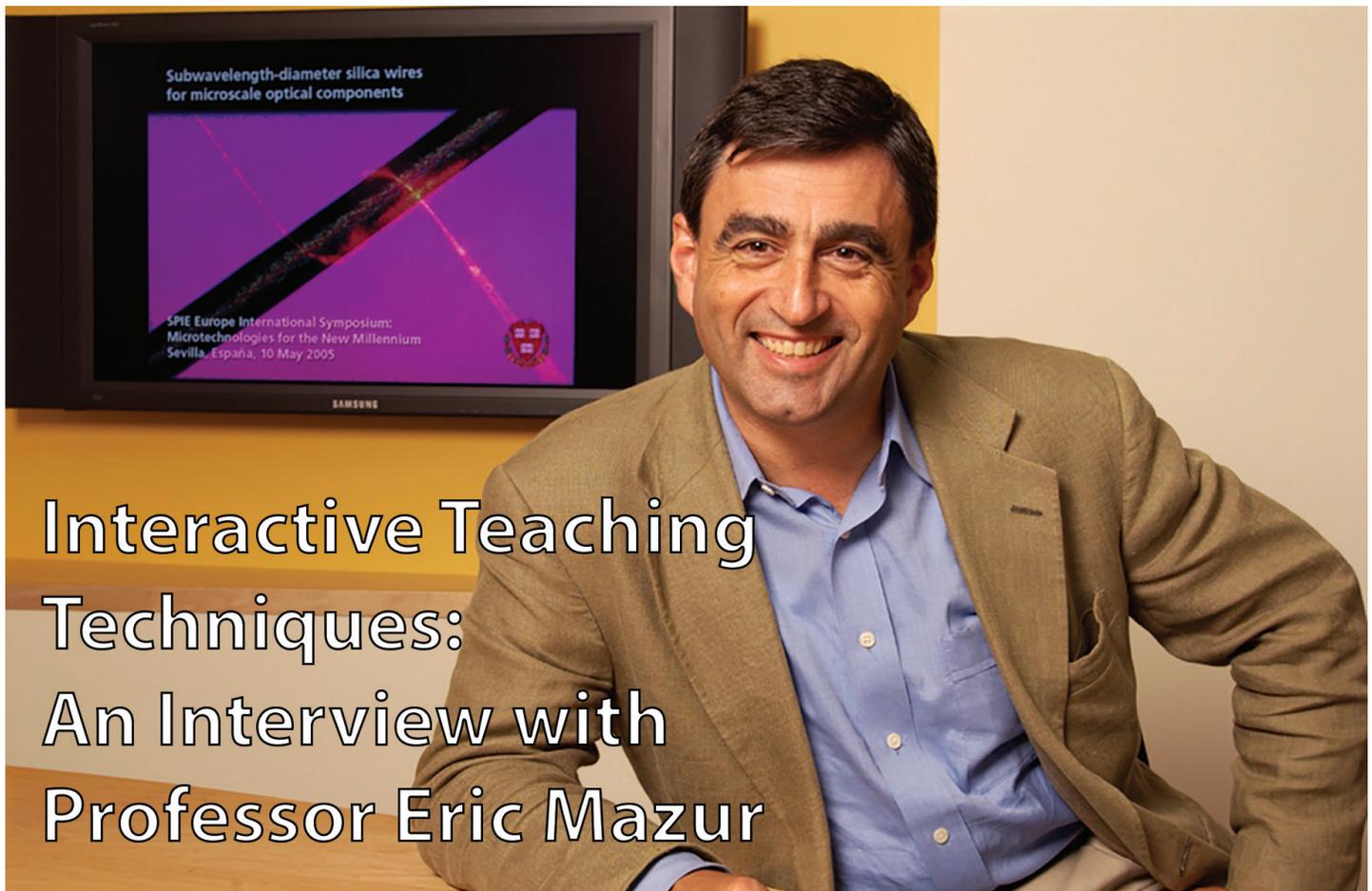
incorrect use of historical statistics, the production of these works is testament to the role they believed Jenner's story played in their debates about compulsory vaccination laws. The truth about who Jenner really was did not matter as much as what his character could do to advance their argument about vaccination. While the Royal Commission professed to not see the history of Jenner as important as modern scientific understanding, they portrayed him as the first in a long line of those who produced evidence, supporting aspects of the BMJ's interpretation. While Crookshank's lengthy volume was largely ignored by policymakers and the public, White's portrayal of Jenner as greedy was effective at convincing many in the public to eventually opt-out of vaccination with the introduction of the conscientious objector clause. In a paradoxical way, the history of the 19th century vaccination debates demonstrates both the strengths and weakness of using presentist history to advocate for health policies.

Now over 200 years later since the first vaccination, should Jenner's story matter in our vaccination discussions? Several news outlets have published narratives linking Jenner's origins to our current vaccine science and policy, with a recent New York Times editorial even going as far as to argue that they "take some comfort in (Jenner's) history" (Motadel, 2021). While many of these pro-vaccination accounts distance current practices from Jenner's less than ethical practice of experimenting first on a nonconsenting child, they praise his "Temple of Vaccina" and provision of vaccines for all (Gower, 2020; Klass & M.D, 2020; Little, 2020). Is this cherry picking of his story effective for spurring policy? Only time will tell. Smallpox vaccination was frequently referred to as Jenner's vaccination, attributing their development to a single man, but our current COVID-19 vaccines are referred to by their company names, for example "Pfizer's vaccine" or "Moderna's vaccine." Conceptualizing a person is very different from construction of a corporation as a character, but similar questions about their motives and methodologies arise. Aside from the Royal Commission, many of those debating vaccination policy in the late 19th century did not separate the "art" from the "artist" when discussing vaccination and Jenner, which allowed for opinions about one to influence conceptions of the other. Will they be kept separate in our discussions today? Only time will tell. In his 1932 address to the American Historical Association, Carl Becker argued "History existed for man, not man for history. The historian's social responsibility was to provide an account of the past appropriate to society's current needs" (Wright & Viens, 2017, p. 14). What will historians deem as our current needs? Once again, only time will tell. If history tells us anything, it is that presentist histories will abound.

Bibliography

- Banks, J. (2007). Scientific correspondence of Sir Joseph Banks, 1765-1820 (Vol. 4). Pickering & Chatto. <http://hdl.handle.net/2027/inu.30000087757401>
- Bartrip, P. W. J. (2004). Hart, Ernest Abraham (1835-1898), medical journalist. Oxford University Press. <https://doi.org/10.1093/ref:odnb/12475>
- Brunton, D. (2004). Baron, John (1786-1851), physician. Oxford University Press. <https://doi.org/10.1093/ref:odnb/1496>
- Crookshank, Edgar M. (1894). Professor Crookshank's Evidence before the Royal Vaccination Commission. *The British Medical Journal*, 2(1759), 618-620.
- Crookshank, Edgar March. (1889). *History and Pathology of Vaccination*. H.K. Lewis.
- Csiszar, A. (2016). Peer review: Troubled from the start. *Nature News*, 532(7599), 306. <https://doi.org/10.1038/532306a>
- Durbach, N. (2004). *Bodily Matters: The Anti-Vaccination Movement in England, 1853-1907* (D. J. Walkowitz, Ed.). Duke University Press. <https://doi.org/10.1215/9780822386506>
- Final report of the Royal Commission appointed to inquire into the subject of vaccination. (n.d.). Wellcome Collection. Retrieved December 18, 2020, from <https://wellcomecollection.org/works/fwjsnv9n/items?sierraId=b21361356>
- Gower, O. (2020, September 10). Cowpox, Covid-19 and Jenner's vaccination legacy. Wellcome Collection. <https://wellcomecollection.org/articles/X1d2gREAA8A3eun>
- Hart, E. A. (1880). The truth about vaccination; an examination and refutation of the assertions of the anti-vaccinators. London, Smith, Elder. <http://archive.org/details/39002086341162.med.yale.edu>
- Holmes, T. (1898). Ernest Hart, M.R.C.S., D.C.L., Editor Of The British Medical Journal, Formerly Chairman Of The Parliamentary Bills Committee Of The British Medical Association. *The British Medical Journal*, 1(1933), 175-186.
- Jenner Centenary Number. (1896). *British Medical Journal*, 1(1847). <https://www-bmj-com.ezp-prod1.hul.harvard.edu/content/1/1847>
- Jones, D. S. (2020). History in a Crisis—Lessons for Covid-19. *New England Journal of Medicine*, 382(18), 1681-1683. <https://doi.org/10.1056/NEJMp2004361>
- Klass, P., & M.D. (2020, May 25). Hoping for a Covid Vaccine and Recalling the One for Smallpox. *The New York Times*. <https://www.nytimes.com/2020/05/25/well/family/covid-vaccine-smallpox-coronavirus.html>
- Little, B. (2020, December 16). 4 Diseases You've Probably Forgotten About Because of Vaccines. *HISTORY*. <https://www.history.com/news/vaccines-diseases-forgotten>
- London Society for the Abolition of Compulsory Vaccination. (1880). *The Vaccination Inquirer and Health Review* (S1720). 1-15. Wellcome Library.
- Moore, W. (2009). John Hunter (1728-1793). In *The James Lind Library*. <https://www.jameslindlibrary.org/articles/john-hunter-1728-93/>
- Motadel, D. (2021, April 28). Opinion | Vaccine Hesitancy Is as Old as Vaccines. I Take Comfort in That. *The New York Times*. <https://www.nytimes.com/2021/04/28/opinion/vaccine-hesitancy-smallpox.html>
- Porter, D., & Porter, R. (1988). The politics of prevention: Anti-vaccinationism and public health in nineteenth-century England. *Medical History*, 32(3), 231-252. <https://doi.org/10.1017/S0025727300048225>
- Professor Crookshank's Evidence before the Vaccination Commission. (1894a). *British Medical Journal*, 2(1750), 81-82. <https://doi.org/10.1136/bmj.2.1750.81>
- Professor Crookshank's Evidence before the Vaccination Commission. (1894b). *British Medical Journal*, 2(1750), 81-82.
- Steinmetz-Jenkins, D. (2020, August 14). Beyond the End of History [The Chronicle of Higher Education]. https://www.chronicle.com/article/beyond-the-end-of-history?cid=gen_sign_in&cid2=gen_login_refresh
- Strochlic, N., & Champine, R. D. (2020, March 27). How they flattened the curve during the 1918 Spanish Flu [National Geographic]. <https://www.nationalgeographic.com/history/2020/03/how-cities-flattened-curve-1918-spanish-flu-pandemic-coronavirus/>
- The "Critical Inquiry." "Of Edgar M. Crookshank, M.B. (1890). *The Journal of the Society of Medical Officers of Health*, II(23). <https://go-gale-com.ezp-prod1.hul.harvard.edu/ps/i.do?p=NCCO&u=camb55135&id=GALE|XCHBAC181830278&v=2.1&it=r&sid=primo>
- White, W. (1885). *The Story of a Great Delusion*. E. W. ALLEN. http://www.gutenberg.org/files/61809/61809-h/61809-h.htm#Page_xxvi
- Wright, C. E., & Viens, K. P. (Eds.). (2017). *The future of history: Historians, historical organizations, and prospects for the field*. Massachusetts Historical Society.

Features



Interactive Teaching Techniques: An Interview with Professor Eric Mazur

Andrea Rivera '22

Balkanski Professor of Physics and Applied Physics and Area Chair of Applied Physics at Harvard University, Member of the Faculty of Education at the Harvard Graduate School of Education, and Past President of the Optical Society, Professor Eric Mazur is a leader in the fields of ultrafast optics, condensed matter physics, and peer instruction. He is widely known for his research and work on Peer Instruction, an interactive teaching method aimed at engaging students in the classroom and beyond. He has been awarded the Presidential Young Investigator Award by President Ronald Regan, the Esther Hoffman Beller Medal by the Optical Society of America, and selected as one of 75 most outstanding American physicists by the American Association of Physics Teachers. THURJ writer Andrea Rivera had the chance to talk to Professor Eric Mazur about Peer Instruction and how it has changed during distance learning as well as his current research.

AR: Thank you so much for agreeing to speak with me. Could you please tell us about your education and your career so far as well as how you got involved with both physics and education?

EM: It has been such a long trajectory. Growing up in the Netherlands, my mother was an art historian and my father was a theoretical physicist so I was constantly torn between the arts and the sciences. However, I developed a passion for astronomy very early on in my life. That means that when I went to Leiden University I chose astronomy as my major, but that didn't last very long because it was taught so poorly that I lost track of the bigger picture. Everything was about plugging numbers into equations and making calculations, but the bigger picture was gone. After that, I switched to physics only to discover that it was no different from what I had experienced in Astronomy. I was very disillusioned for a long time, until I joined a research group. That's when I rediscovered the beauty of doing science. Now, rather than replicating what people had done before, I was discovering how nature works and if it hadn't been for that, I would have probably dropped out and my life would have been very different.

I went on to complete my Ph.D. at the same institution

and the same research group I worked with during undergrad. After graduating, I really wanted to work in industry because my parents were academics and I desperately wanted to do something different. My father, however, encouraged me to postpone my job offer at Phillips to go study in the US for a couple of years and learn more about lasers and optics. I got an offer from Harvard and here I still am, believe it or not. I was only supposed to stay at Harvard for two years, but they offered me an assistant professor position. Six years later, I got tenure and instead of going into industry, I ended up in academia.

“It made no sense to me. I, the expert, spent more than 10 minutes explaining it without any effect and the students just talked to each other for two minutes and got it.”

AR: We know that you are an avid advocate for peer instruction and interactive teaching. How do you think this approach to teaching is different and how do you implement it in your teaching style?

EM: When I started teaching, I naively thought that because I learned physics by listening to lectures, that my students were going to learn physics by listening to me and I never questioned the underlying assumption that's there. For me, it was so obvious that that's how you teach. To make matters worse, I started getting very high evaluations so I thought I was doing a great job. It wasn't until 1990 that I read an article in the American Journal of Physics that claimed that students learn next to nothing in an introductory physics course that I began to question my teaching style. The research consisted of a short test given to a large number of non-physics majors and physics majors at the beginning of a semester-long introductory physics course as well as at the end, and then they later compared the scores and the results showed that there's hardly any difference between the initial and final scores. They also showed that the scores did not correlate with teaching evaluations.

When I read that article I was very skeptical about it because I thought there was no way that this would apply to my class. I was determined to show that in my class, my students would ace the post-test. That was a transformative moment in my career because the results

were in fact no different from the research findings. That led to quite a bit of soul searching and it helped me discover that the students became very good at solving the computational problems at the end of the course, but when they were word-based questions they would flunk completely because they had no underlying conception of the topics. As I was discussing the test with my students, I could tell by their confused faces that they didn't understand my explanation. So I said to them, why don't you just discuss the questions with each other? Something happened that I had never seen in my lecture-based classrooms: they convinced each other of the right answer in less than two minutes. It made no sense to me. I, the expert, spent more than 10 minutes explaining it without any effect and the students just talked to each other for two minutes and got it. Later, I realized that it's because I learned the subject a long time ago. For me, it's so obvious that I can no longer imagine what the difficulties are in learning the material. And that's what gave rise to peer instruction. The students are more likely to convince their peers than the professor who is in front of the class because they understand better what's going on in their brain. Although I never intended to create a new instructional technique, it took off from there.

“And that's when I thought, let's see if we can give back some of the things we do in the classroom to high school students. It also gives my students a sense of a higher purpose. Adding a component of empathy or social goods makes it so much more engaging for the learner.”

AR: That's really interesting. Given the pandemic, what was the biggest barrier bringing this approach virtually?

EM: The peer instruction that we do now in the classroom is completely asynchronous. I found that by trying this approach synchronously many students would not have enough time to fully think about the problems in the allotted time while others would fly through the questions. That's why we divided the students into

similar groups in order to account for these differences. I believe in learning, by doing whether it's for instruction or anything else. I think that's the key point in the virtual approach.

AR: That's a great approach! In your introductory physics course this year, your students present their class projects to high school students all over the world. What inspired this idea?

EM: Before the pandemic, we had the class project fairs in a public space on campus. I would ask colleagues to come from Harvard and MIT to be the judges. When we went online, I found it very difficult to recruit colleagues because everybody was so preoccupied with keeping their own courses running. In retrospect, I'm laughing about this because even though we were on zoom I was still looking for local judges when it doesn't matter where you are as long as it's an accessible time zone. People can be anywhere so I started to invite colleagues from universities in Europe, Brazil, and so on. However, over the summer, I thought that we should really open this up to a much broader public. I'm actually the PI on a grant for the National Science Foundation, which essentially attempts to improve high school physics education as well as high school science education in general. Through this project, we have found that many teachers are struggling to find ways to keep their high school students busy and learning the material in creative ways, not just in the US but all over the world. And that's when I thought, let's see if we can give back some of the things we do in the classroom to high school students. It also gives my students a sense of a higher purpose. Adding a component of empathy or social goods makes it so much more engaging for the learner.

“I'm connected to my students in a way that I have never been connected to. Teaching is not just about delivering knowledge, it's so much more. There's a human connection to it. Strangely enough, the way I teach now is so much stronger.”

“All human beings are born scientists. We're all innately wired to want to understand the world around us from a very young age. We all have an innate desire to want to know why. And science is all about asking why.”

AR: I completely agree. As a student in the course, I am really glad that we get to share what we learn with younger students. I am curious as to how you think instruction will change after being a whole year online? And if you think that there are any lessons that we can learn?

EM: I love this question. It is a really great question. In fact, it's keeping me awake at night right now because we just received the news that Harvard is planning to bring everybody back to campus in August and I feel a sense of both relief and worry. I'm connected to my students in a way that I have never been connected to. Teaching is not just about delivering knowledge, it's so much more. There's a human connection to it. Strangely enough, the way I teach now is so much stronger. The data that I've collected in my classes shows that our approach now is significantly better than it was a year ago when we were on campus. The learning is better, the feeling of being part of a community is higher, and the sense of growth and autonomy is larger. So I think that in a sense, I have seen the way to a better future. One of the things I've discovered with online platforms is that every student is sitting in the front row. The engagement can be so much better if you do it in a smart way. Now, I'm not advocating that we do everything online from now on. However, we really need to sit down and evaluate what has worked and what hasn't because it hasn't all been bad. For some activities, I actually am starting to believe that the pandemic has shown us a way to the future that would otherwise have taken maybe another hundred years or so.

AR: I agree. Although we're all eager to go back to in-person instruction, we definitely need to reflect on what has worked during the past year. However, I wanted to quickly talk about your work before we finish. Could you briefly describe your research?

EM: There are three parts of my research group. One part focuses on education research and ways to improve education using data we've collected in AP50 and other courses. The other two parts are in biophotonics and nanophotonics.

Nanophotonics is the field that deals with the manipulation of photons particles of light at the nanoscale. Most of our modern technology including smartphones, computers, etc. all manipulate electrons at the nanoscale. However, electrons are very power-hungry and most of the energy they use is wasted on heat rather than actual computation. This means that if we are able to replace computation with electrons, by computation with photons we would solve an energy problem. The problem is that we don't have a very good ability to manipulate light at the nanoscale, at least not in a way that's easily scalable. Part of my group works on developing materials that permit the manipulation of light at the nanoscale. Although we are still far from application, technology moves fast and we are very happy with what we have been able to do so far.

The biophotonics part of my research group uses light to manipulate living matter. We started by conducting research on the viscoelastic properties of fibers in collaboration with a professor from Harvard Medical School. In essence, we created a technique to do subcellular surgery by developing a scalpel that permits you to go inside the cell and make a cut without killing the cell or damaging the cell membrane. Light is actually perfect for that because you can focus it very tightly so that the cell membrane is not in the focused part of the beam, but rather whatever organelle you want to hit inside the cell. This was just the beginning, right now we are focusing on using light to deliver cargo to cells. For example, there are many techniques to deliver cargo to cells, either a fluorescent marker or CRISPR-Cas9, and the way that these techniques typically do so is through electroporation, which ends up killing a lot of cells. This is why we developed a technique that is completely optical and that permits you to actually tolerate and deliver cargo to a very large number of cells in parallel. In fact, we keep discovering new ways and substrates to facilitate this technique. It's incredibly exciting because even though we know the technique works and we can make it work, the exact mechanism is still unclear, which is of course both frustrating and exciting. It's frustrating because we'd like to understand exactly how it works but it's exciting because it means there's something to be discovered here.

AR: That sounds amazing! I hope that readers who are interested in these fields can learn something new through this important research being conducted by the Mazur group. To conclude, what advice do you have for aspiring scientists and researchers?

EM: All human beings are born scientists. We're all innately wired to want to understand the world around us from a very young age. We all have an innate desire to want to know why. And science is all about asking why. That's why I think to be a successful scientist it's important to never give up on the inner child in you. My advice would be to never lose that innate curiosity. Nothing is more fulfilling than discovering how something works, regardless of whether or not somebody else has already thought of it.

AR: That is an amazing way to view science and some of the best advice I've heard for aspiring researchers as well! Thank you so much for taking the time to talk to me and answer my questions.

EM: You're welcome, Andrea. I really appreciate your questions. Thank you!

Discovering ourselves with EEG



Serena Zhao '24

In recent decades, the field of neuroscience has been advancing at extraordinary rates. From treatments for neurodegenerative diseases, to neuron formation and restoration, to relationships between behavior and brain chemistry, many important discoveries have been made in humanity's pursuit to understand its most complex organ: the brain. What was once elusive is becoming more clear to us, but while this clarity brings great scientific and medical potential for human health, it also requires us to re-examine our ethical boundaries in science.

One of the most crucial and advanced organs in the human body, the human brain is the command center for the human nervous system, making up about 2 percent of a human's body weight. Though it has the same basic structure as other mammal brains, the human brain is larger in relation to body size compared to other brains.¹ This larger size is a defining feature of human anatomy and allows the human brain to specialize to a more detailed extent than other mammal brains. Functional specialization is a common property of biological systems, so it comes as no surprise that the brain may exhibit this same type of specialization.² While the true extent of functional specialization (versus a more general-purpose model of function for the brain) is still being studied today, hemispheric specialization is a prominent characteristic of the organization of the human brain.³

Also known as cerebral dominance or lateralization of function, hemispheric specialization is the relative specialization between the two hemispheres of the human brain: the right hemisphere is better suited for more holistic and coarse information processing, while the left hemisphere is better suited for more analytic and fine-grained processing. When demand for task processing is high, the brain's processing capacity can be increased by interaction between these two processors.⁴ Specialization of the brain accounts for our dexterity, capability for higher-level reasoning, ability to feel nuanced emotions, and other unique cognitive and emotional capabilities

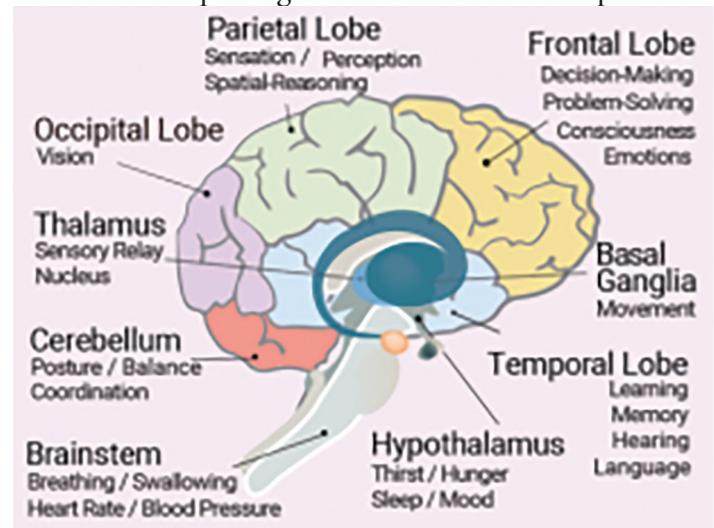


Figure 1. The brain is subdivided into several physically distinct specialized areas and several lobes.

that humans possess. In addition, this type of structural and functional organization is significantly capitalized upon in scientific studies and experiments related to the brain, a point that will be explored throughout this article.

"little disturbances on an individual's brain have the ability to damage major cognitive, emotional, and motor functions."

Since the earliest civilizations, humans have been intrigued by the brain - and rightly so, for the brain is the root of a whole host of medical conditions, from mild headaches to life-threatening glioblastomas.⁵ Unfortunately, out of all the organs in the human body, the brain may be the most difficult one to study, with and without modern technologies. The brain is an incredibly delicate organ, and little disturbances on an individual's brain have the ability to damage major cognitive, emotional, and motor functions. This means that, in order to study the brain while it is alive, we must either employ completely non-invasive technologies or have a very good understanding of what can and cannot be touched, both of which are high requirements. Because of this, ancient civilizations studied human cadavers, which lacked living brain cells and thus could not show the living processes of the brain. In recent years, however, this has changed.

Diving into our Brains

In order to study the brain, we must first understand how the brain functions. The brain contains 80-100 billion nerve cells, or neurons, each of which are connected to more than 1,000 other neurons. In total, there are around 60 trillion connections, or synapses. These synapses become important when we examine exactly how neurons transmit information. Neurons communicate with each other using electrochemical signals - which is simply an electrical signal produced by chemical changes - by changing ionic concentrations across a cell membrane to affect the electrical charge of the neuron. This mechanism is best explained by an example: suppose you stubbed your toe on a wall. This stimulus - the painful action of stubbing your toe - causes neurons in your body to respond by taking in more positive ions, which makes the cell more positively charged. Once the cell reaches a certain charge threshold (approximately -55 mV), the neuron fires an action potential, which is an event that occurs when a cell membrane rapidly gains positive charge (depolarization) and then loses it (repolarization). The action potential

travels through the length of the neuron, but once it reaches the end of the neuron, the electrical signal triggers the release of neurotransmitters into the synapse between the next neuron. These neurotransmitters are able to cross the synapse and attach to receptors on the next neuron, acting as a stimulus to activate that neuron and continue the signal, restarting the process above.⁶ This effectively sets off a chain reaction that is complete when the signal finally reaches the brain, where it is processed (at which point you will consciously register the pain coming from your stubbed toe). This whole process is also extremely efficient: even though neurons range from less than a millimeter to more than a meter in length, the speed of a signal ranges from 1 mile per hour to upwards of 268 miles per hour, depending on the type of neuron.⁷

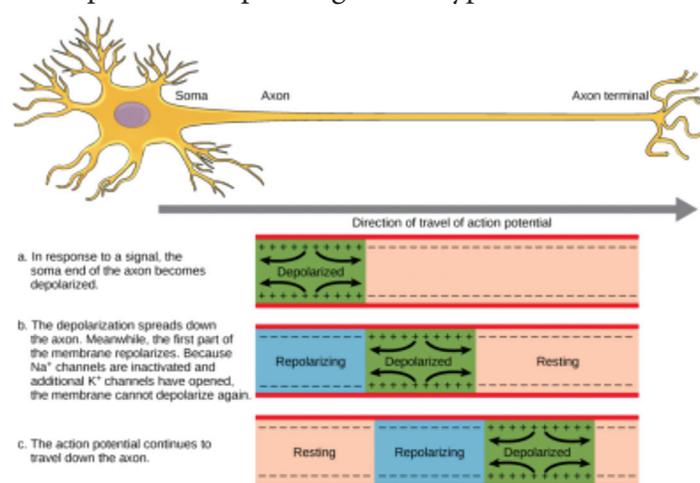
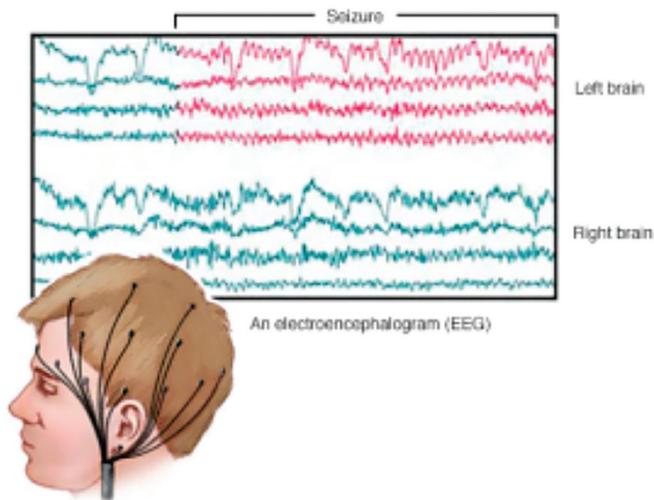


Figure 2. An action potential originates at the cell body of a neuron and propagates towards the axon terminal, where neurotransmitters are released into the adjacent synapse.⁴

At the heart of neural activity is electrochemical signals that trigger such activity, so it only makes sense that we study brains and brain functions through the lenses of electricity. This has several advantages, among them considerations for both scientific accuracy and convenience. Firstly, there are methods of studying electrical activity - with electrodes and signal measuring devices - that do not require direct contact with the source of electrical activity. This means that we do not have to cut open a person's head to study their brain, eliminating the necessity of using human cadavers. Secondly, since electrical activity can be studied without opening brains, living people may be used to study brain activity: this opens the realm of discovery beyond just physical brain structure and allows scientists to examine how living brains function and react to different stimuli. Finally, electrical activity is simple to measure and yields relatively accurate results, allowing us to obtain scientifically accurate and objective data.

EEG: The Father of Neuroimaging Techniques

Indeed, recent neuroimaging techniques reveal that scientists are studying brains through a variety of biomarkers and indicators, including electrical activity. Electroencephalography (EEG) is a method that records the brain's electrical waves to detect abnormal activity, such as in seizures and sleep disorders. ("Scanning the Brain") EEG tests are conducted in a variety of settings, from medical diagnoses to clinical trials. During an EEG test, electrodes made of small discs with thin wires attached are pasted onto the subject's scalp. The electrodes detect electrical charges originating from neuron activity and amplify these charges, and a computer connected to the electrodes records the amplified charges. The recorded electrical signals then appear as a graph on a computer screen or as a printed recording on paper. Trained professionals are then able to analyze the results based on EEG wave shape, amplitude, frequency and any unusual behavior. ("Electroencephalogram (EEG)")



© MARI FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH. ALL RIGHTS RESERVED.

Figure 3. Wired electrodes are attached to a person's scalp during an EEG scan, and the resulting readings appear as peaks that reveal where brain activity spikes and dulls.¹⁸

EEG is used to diagnose a variety of conditions. Historically, EEG has been used to observe and diagnose epilepsy, brain lesions resulting from tumors or stroke, brain trauma, drug intoxication, and narcolepsy, or any other medical condition that involves a change in brain activity or related abnormalities. ("Electroencephalogram (EEG)") More recently, the boundaries of EEG use are being pushed and refined, as new medical uses are discovered and the actual technology is improved. In particular, EEG use in the realm of psychiatric practice is being studied and developed, with studies supporting the use of EEG in diagnosis and treatment of autism spectrum disorder (ASD) and schizophrenia.^{8,9} EEG could serve

as a method to diagnose ASD for refractory cases or for individuals who are on anti-seizure medication but still exhibit aggressive behaviors.⁸ Similarly, EEG could be incorporated into a precision medicine approach to treat cognitive impairment in schizophrenia: with tailored treatments to each individual, overall treatment efficacy may rise.⁹ In addition, the accuracy of EEG methods is sometimes compromised due to reliance on a trained professional to visually examine the produced wave graph, so researchers are developing new machine learning methods to complete EEG classification tasks. Theoretically, these deep learning methods can increase the accuracy and efficiency of EEG methods, thereby increasing their practicality in the real world.¹⁰

Personalizing Brain Discovery

While most might think of EEG as a purely medical device, this has proven untrue in recent years. The convenience of EEG has led it to become a device used outside of laboratories and medical centers for a whole host of purposes, most of them far from medical. EEG is uniquely beneficial for medical, commercial, and personal use. Among all of the different methods - MRIs, fMRIs, PET scans, CT scans, and more - used to study the brain, EEG is the most cost-efficient. It does not require expensive equipment, nor is significant training necessary to understand how to operate an EEG device. In addition, EEG is an extremely non-invasive method and powerful due to its ability to directly measure brain activity, making it a very useful device for diagnostics. For these reasons, scientists and engineers are continuously looking for new and improved ways to utilize EEG in medical and commercial settings.

Most notably, EEG devices are being used to study the effects of meditation on a meditator's mind state as well as the process of meditation itself, with the goal of expanding the accessibility of this practice and its benefits to all. Researchers are analyzing EEG data to detect meditation brain states, using various data analytics techniques and measurements. In particular, characteristic features of brain wave data are being isolated and inputted into machine learning algorithms to classify the "meditation state" from other brain states. Researchers are also optimizing this classification process for greater accuracy and applicability: their hope is that, by generating a machine learning algorithm that can classify meditative states from other states, people can use a device built on this algorithm to more efficiently practice meditation.¹¹

Another interesting application of EEG technology is

measuring - and improving - focus and attention. This is particularly applicable to present-day: many people spend all day staring at a computer, trying to be as efficient as possible in work, but most find themselves

researchers are diving into how to make EEG products wearable and accessible to the general public

daydreaming or mentally wandering after some period of time, which detracts from their productivity. Researchers are interested in two fronts: firstly, the application of EEG in detecting and recognizing human attention and secondly, the potential for EEG technology to train human attention and focus. One study developed EEG detection tools, connected to mobile sensors, that are able to classify the attentiveness of students in class with an accuracy rate of 76.82%. This demonstrates the potential for EEG to recognize human focus with relative accuracy, which could decrease the burden on humans themselves to analyze each other's focus (case in point: teachers forced to read students' expressions to determine if they are focused).¹² Furthermore, a second study demonstrated the ability for a wearable EEG-based game to improve the focus of individuals with Attention Deficit Hyperactivity Disorder (ADHD) and Attention Deficit Disorders (ADD), two disorders characterized by the lack of attention and focus. The wearable EEG technology is able to measure brain focus, and these results are used to produce a virtual reality game that the wearer can play to improve focusing ability. The study found such a device to produce an average improvement of 10% in engagement and 8% in focus for people who utilized the EEG-controlled device compared to the same game but keyboard-controlled.¹³

In order to truly publicize the benefits of EEG technology, devices must be geared towards use by the general population - that is, by people who might not have a background in neuroscience, meditation, or electroencephalography. On this front of personalized brain discovery, entrepreneurs and researchers alike are diving into how to make EEG products wearable and accessible to the general public, and studies are being conducted to examine the applicability of EEG technology to personal use. Studies have found that this is a viable use of EEG, and current avenues pursued in this research area involve optimizing the EEG headsets for convenient usage and developing EEG protocols that are simple without

compromising data accuracy. One such study utilized a headset with dry electrodes as opposed to conventional wet electrodes, since home users will likely not want to purchase and apply gel to their scalp each time they use an EEG headset. The study found that EEG signals, collected in such a way, is a viable method of detecting meditation and other attention-based activities.¹⁴ Another study developed self-calibrating protocols for wearable EEG headsets, allowing each headset to become "personalized" to the user by enabling the headset to recognize mind states and brain waves unique to that person.¹⁵ Studies like these are becoming increasingly important to ensure the accessibility of EEG technology.

Commercialization for the Future

While the affordability of EEG suits it for a variety of commercial and personal purposes, the commercialization of this type of neurotechnology does not come without its costs and dangers. Currently, wearable EEG headsets are already available from companies like Muse, EMOTIV, and NeuroSky, but what is glaringly lacking are neuroethics protocols that guide how personal neuro-data is to be stored, used, and treated. In addition, there are cybersecurity concerns surrounding brain-computer



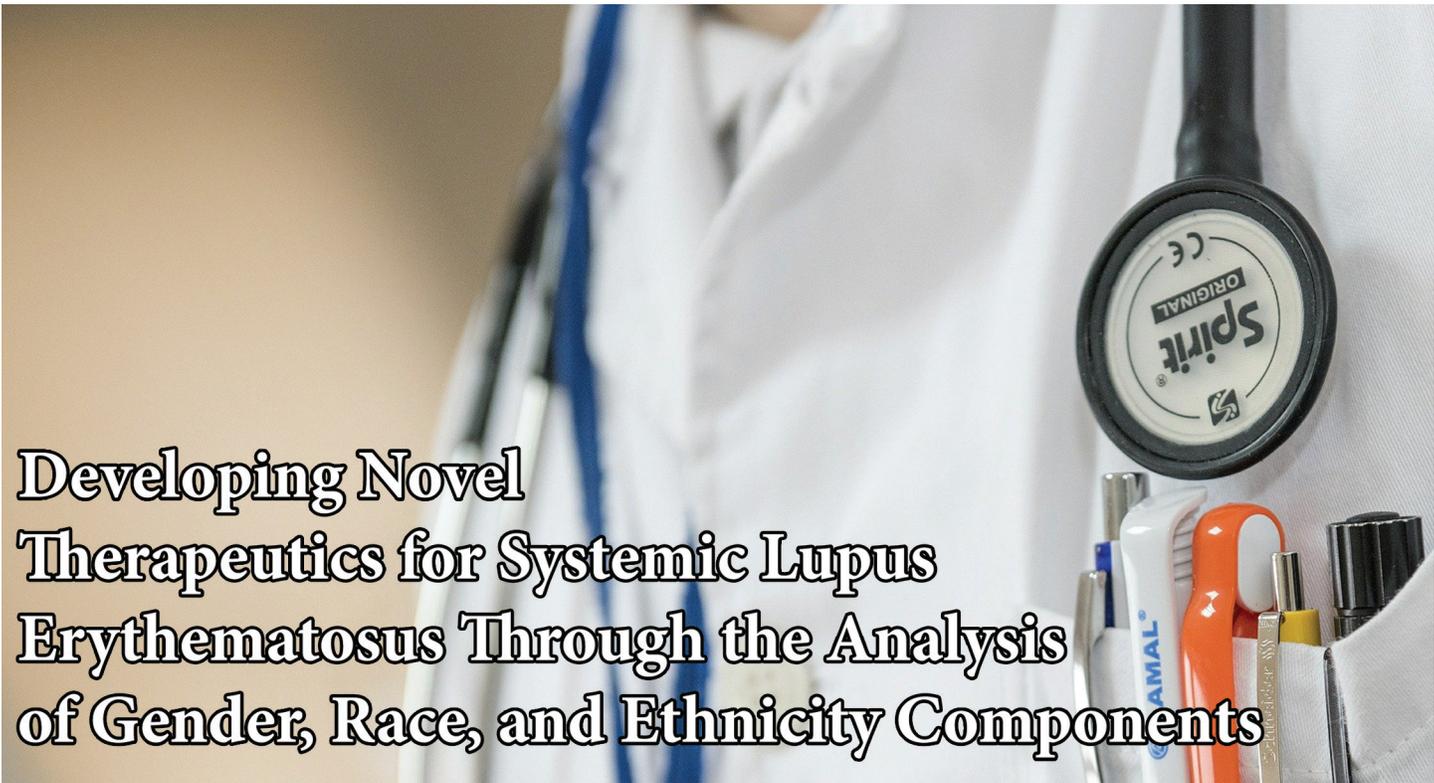
Figure 4. Wearable EEG headsets can be paired with mobile applications and games for mental training.¹⁷

interface (BCI) systems, which leverage brainwave information acquired by a brain monitoring device - such as an EEG device - to interact with a computerized system. Such systems are prone to attacks and must be secured and controlled to ensure that personal data is not leaked, much like protecting our email and bank account passwords.¹⁶

As EEG and BCI technology advances, we must address these neuroethics and cybersecurity concerns before valuable, private information is carelessly lost or immorally used. However, the benefits of EEG are undeniable, and it is the responsibility of the scientific community to ensure that these benefits are available to all: perhaps in 20 years, all of us will be able to improve our attention span with custom EEG headsets, safely guarded by established security and ethics protocols.

References

- Lewis, Tanya. "Human Brain: Facts, Functions & Anatomy." LiveScience, Future US Inc., 28 Sept 2018, www.livescience.com/29365-human-brain.html.
- Mahon, Bradford Z. and Cantlon, Jessica F. "The Specialization of Function: Cognitive and Neural Perspectives." *Cogn Neuropsychol*, vol. 28, no. 0, pp. 147-155. Published 25 March 2014.
- Kanwisher, Nancy. "Functional specificity in the human brain: a window into the functional architecture of the mind." *PNAS*, vol. 107, no. 25, pp. 11163-11170. Published 22 June 2010.
- Banich, M.T. "Hemispheric Specialization and Cognition." *Encyclopedia of Neuroscience* (2009), pp. 1081-1086. "Biology for Majors II." Lumen Learning, <https://courses.lumenlearning.com/wm-biology2/chapter/action-potential/>.
- Hoffman, Matthew. "Brain (Human Anatomy): Picture, Function, Parts, Conditions, and More." WebMD, WebMD, <https://www.webmd.com/brain/picture-of-the-brain>.
- Penttila, Nicky. "How Does the Brain Work?" Dana Foundation, Dana Foundation, 27 Sept 2019, <https://www.dana.org/article/how-does-the-brain-work/>.
- Ross, Valerie. "Numbers: The Nervous System, from 268-MPH signals to Trillions of Synapses." *Discover Magazine*, Discover Magazine, 17 Oct 2019, <https://www.discovermagazine.com/health/numbers-the-nervous-system-from-268-mph-signals-to-trillions-of-synapses>.
- Swatzyna, Ronald K., Tarnow, Jay D., Turner, Robert P., Roark, Alexandra J., MacInerney, Erin K., and Kozlowski, Gerald P. "Integration of EEG Into Psychiatric Practice: A Step Toward Precision Medicine for Autism Spectrum Disorder." *Journal of Clinical Neurophysiology*, vol. 34, no. 3, pp. 230-235. Published May 2017.
- Joshi, Yash B. and Light, Gregory A. "Using EEG-Guided Basket and Umbrella Trials in Psychiatry: A Precision Medicine Approach for Cognitive Impairment in Schizophrenia." *Front. Psychiatry*, vol. 9, no. 554. Published 19 November 2018.
- Craik, Alexander, He, Yongtian, and Contreras-Vidal, Jose L. "Deep learning for electroencephalogram (EEG) classification tasks: a review." *Journal of Neural Engineering*, vol. 16. Published 9 April 2019.
- Lin, Hong and Li, Yuezhe. "Using EEG Data Analytics to Measure Meditation." In: Duffy V. (eds) *Digital Human Modeling. Applications in Health, Safety, Ergonomics and Risk Management: Health and Safety*. DHM 2017. *Lecture Notes in Computer Science*, vol. 10287. Published 14 May 2017.
- Liu, Ning-Han, Chiang, Cheng-Yu and Chu, Hsuan-Chin. "Recognizing the Degree of Human Attention Using EEG Signals from Mobile Sensors." *Sensors*, vol. 13, no. 8, pp. 10273-10286. Published 9 August 2013.
- Alchalabi, A. N., Eddin, A. N. and Shirmohammadi, Shervin. "More attention, less deficit: Wearable EEG-based serious game for focus improvement." 2017 IEEE 5th International Conference in Serious Games and Applications for Health (SeGAH), pp. 1-8. Date of Conference: 2-4 April 2017.
- Anwar, Dilnashin, Naik, Vinayak, Gupta, Anubha, and Sharma, S.K. "Detecting Meditation using a Dry Mono-Electrode EEG Sensor." 2017 9th International Conference on Communication Systems and Networks (COMSNETS), pp. 508-513.
- Karydis, Thrasyvoulos, Langer, Samuel, Foster, Simmie L., and Mershin, Andreas. "Identification of post-meditation perceptual states using wearable EEG and Self-Calibrating Protocols." *PETRA '18: Proceedings of the 11th Pervasive Technologies Related to Assistive Environments Conference*, pp. 566-569. Date of Conference: June 2018.
- Landau, Ofir, Puzis, Rami, and Nissim, Nir. "Mind Your Mind: EEG-Based Brain-Computer Interfaces and Their Security in Cyber Space." *ACM Computing Surveys*, vol. 53, no. 1. Published February 2020.
- Dorfman, Peter, et al. "Custom EEG Headset Could Transfer In-Home Brain Rehabilitation." *Redshift EN*, 13 Apr. 2020, redshift.autodesk.com/eeg-headset/.
- "EEG (Electroencephalogram)." Mayo Clinic, Mayo Foundation for Medical Education and Research, 15 Apr. 2020, www.mayoclinic.org/tests-procedures/eeg/about/pac-20393875.



Developing Novel Therapeutics for Systemic Lupus Erythematosus Through the Analysis of Gender, Race, and Ethnicity Components

Dianelis Lopez '22

Autoimmune diseases occur when the body's defense mechanism i.e. the immune system fails to recognize self-antigens and attacks healthy tissues, leading to damage. There has always been a need to understand how autoimmune diseases develop and, more recently, how gender, race, and ethnicity play a role in the disease progression. For example, systemic lupus erythematosus (SLE) is an autoimmune disease that can lead to skin lesions, joint damage and kidney disease such as lupus nephritis.¹ Research has shown that demographic factors may impact the progression of SLE and lead to more severe versions of the disease, among these factors are gender, ethnicity, race, and perception of healthcare. Young women between adolescence and menopause are disproportionately affected by lupus, indicating that sex chromosome related genes and sex hormones may be implicated in its pathogenesis.² However, the differences in gene profiles between women and men with SLE are still not fully known. Additionally, racial and ethnic minorities are more severely impacted by SLE. Although race and ethnicity is not necessarily associated with a higher prevalence, it is associated with a more severe progression of the disease that leads to more organ complications. Awareness of how this disease disproportionately affects some subgroups of the population calls for the need to develop novel therapeutics

for systemic Lupus Erythematosus through the analysis of gender, race, and ethnicity.

"Comparing the manifestation of lupus across different ethnic and racial groups has revealed pathological discrepancies."

Comparing the manifestation of lupus across different ethnic and racial groups has revealed pathological discrepancies, which indicates that lupus causes more severe symptoms for blacks, Asian/ Pacific Islander, and hispanic.³ The difference in disease progression involved kidney abnormalities, neurological manifestations, and blood manifestations.⁴ This led to a greater risk of showing symptoms of lupus nephritis, thrombocytopenia, and antiphospholipid syndrome. Through several epidemiological studies, it has been proposed that lupus pathogenesis is impacted by genetic profiles and differences in environment. Accounting for these confounding factors could direct research towards the development of novel therapeutics that focus on specific pathways related to ethnicity or race. The current treatment options for lupus involve taking anti-inflammatory agents and immunosuppressive drugs; however, there haven't been significant efforts in researching gender or ethnic/ racial specific pathways.

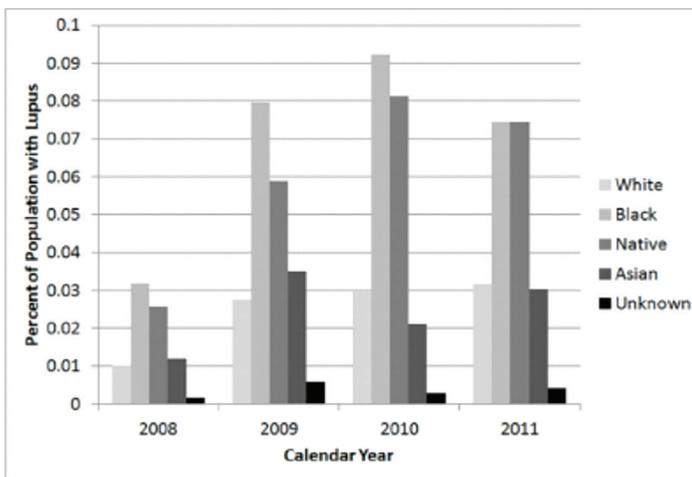


Figure 1: Bar graph based on a sample from the Washington State population, demonstrating the prevalence of lupus hospitalizations according to race, 2008 through 2011.

Aside from the biological differences across different populations, it is also important to account for a patient's personal experiences and how that might affect their disease. When studying diseases, researchers tend to primarily focus on the biological components and ignore the impact of personal narratives on disease development.⁵ As mentioned earlier, it seems as if ethnicity and race are significant predictors for the progression of systemic lupus erythematosus; however, the research on this area is limited. Most of the studies available tend to study genetic differences, rather than exploring other categorical predictors, such as immigration status or socioeconomic background.

"Researchers tend to primarily focus on the biological components and ignore the impact of personal narratives"

These factors tend to be significant predictors when assessing an individual's perception of healthcare. Healthcare perception might be impacted by cultural values which influenced how a person views a disease and the treatment options they are willing to follow. When prescribing a treatment plan, a physician needs to account for patient compliance and adherence to the medication suggested. For groups that have suffered from marginalization and exploitation, there are underlying factors that contribute towards government mistrust.⁵ This phenomenon can be viewed when patients refuse to follow a suggested treatment plan due to incongruencies with their culture. Usually, the patient does not communicate these conflicts to the doctor, and the doctor remains unaware. Additionally, factors such as language barriers

are usually associated with a more severe progression of disease given that these patients are more prone to not comply with physician's recommendations given a lack of understanding.

"The success of a treatment plan is not only dependent on the efficacy of the medication, but also on the equitable distribution of the treatment"

Given the impact these factors can have on disease development, there should be tailored cultural interventions that are designed in order to improve the perception of healthcare resources, which would ameliorate the health disparities.⁵ If populations from different ethnicities and races start to seek medical treatment at the same rate, then the advancement of severe versions of disease could become more controlled. Additionally, adjusting for these components could also inform the process of developing more targeted treatment delivery that maximize patient compliance by considering cultural factors. Usually, minority groups might feel disenfranchised by the system and struggle to seek medical attention. This could inadvertently lead to the development of more severe symptoms that could have been preventable. It is important to develop a preventive healthcare model where individuals can avoid extreme symptoms, instead of attempting to treat preventable symptoms. The success of a treatment plan is not only dependent on the efficacy of the medication, but also on the equitable distribution of the treatment and the ability of the patient to adhere to such treatment. The road to minimize healthcare disparities when referring to SLE is dependent on developing more comprehensive research studies that adjust for significant factors in disease development.

References

1. Feldman, C. H., Hiraki, L. T., Liu, J., Fischer, M. A., Solomon, D. H., Alarcón, G. S., Winkelmayer, W. C., & Costenbader, K. H. (2013). Epidemiology and sociodemographics of systemic lupus erythematosus and lupus nephritis among US adults with Medicaid coverage, 2000-2004. *Arthritis and rheumatism*, 65(3), 753-763. <https://doi.org/10.1002/art.37795>
2. Drenkard, C., & Lim, S. S. (2019). Update on lupus epidemiology: advancing health disparities research through the study of minority populations. *Current opinion in rheumatology*, 31(6), 689-696. <https://doi.org/10.1097/BOR.0000000000000646>

3. Leong, P.Y., Huang, J.Y., Chiou, J.Y. et al. The prevalence and incidence of systemic lupus erythematosus in Taiwan: a nationwide population-based study. *Sci Rep* 11, 5631 (2021). <https://doi.org/10.1038/s41598-021-84957-5>
4. Isenberg, D., Appel, G. B., Contreras, G., Dooley, M. A., Ginzler, E. M., Jayne, D., Sánchez-Guerrero, J., Wofsy, D., Yu, X., & Solomons, N. (2010). Influence of race/ethnicity on response to lupus nephritis treatment: the ALMS study. *Rheumatology (Oxford, England)*, 49(1), 128–140. <https://doi.org/10.1093/rheumatology/kep346>
5. Rodgers, W., Williams, E. M., Smalls, B. L., Singleton, T., Tennessee, A., Kamen, D., & Gilkeson, G. (2020). Treating Systemic Lupus Erythematosus (SLE): The Impact of Historical Environmental Context on Healthcare Perceptions and Decision-Making in Charleston, South Carolina. *International journal of environmental research and public health*, 17(7), 2285. <https://doi.org/10.3390/ijerph17072285>

