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“We know already that although machine learning has huge potential, data sets with ingrained biases will produce biased results – garbage in, garbage out.”

– Cathy O’Neil

To Our Readers

In every previous volume of Quaesitum, we have attempted to display the breadth and richness of undergraduate research taking place at the U of M. As in the past, the submissions in our 13th Volume cover an array of topics, including Immigration and the Mormon Church, Jazz Music, PTSD, and Collagen Scaffolding. They represent perspectives from disciplines as diverse as Political Science, History, Psychology, and Biomedical Engineering.

One ‘common theme’ that emerges in some of the papers included here and in academic inquiry overall has been the role of Artificial Intelligence (AI). In some cases, the discussion has highlighted ways to police or prevent those who use AI to complete academic tasks. In other cases, the discussion has examined the potential positive possibilities of AI as an instructional or communicative vehicle. Regardless of where one falls on this divide, all seem to agree that “AI is here to stay.”Given the prominence of AI as a topic in academic life and discussion, this edition of Quaesitum includes a collection of short editorial pieces written by faculty researchers at the U of M. Each one explores some facet of AI as it applies to education, culture, or society. Each also approaches aspects of AI drawing on different disciplinary perceptions (Psychology, Social & Political Science, and Linguistics). It is our hope that these perspectives will promote increased discussion about AI and the role it will undoubtedly continue to play in research.

As is the case every year, there are many people whose efforts are vital to the production of this journal. Without Dr. Melinda Jones, my co-editor, and Ms. Ifeoluwa Awopetu, our technical editor, this publication would not have come to fruition. Mr. Gary Golightly also continues to impress every year by capturing in graphic form the spirit of Quaesitum and the research it includes.

This year we have also been joined by Roger James Lifschultz, a student editor and Mellon Fellow, who gave us an important student perspective on marketing, communication, and content.

Our heartfelt thanks also goes to the panel of reviewers. Each year, they agree to take on a task without much glory, but their efforts ensure consistent quality and integrity in the work we publish. The faculty sponsors deserve accolades of their own, since their guidance and encouragement are at the root of the research represented here.

As always, the researchers themselves deserve the greatest praise. The student authors, Hallah Abu-Atieh, Cate van Norstrand, Sang N. T. Nguyen, and Audrey Alberson not only undertook the task of research, they also accepted the vulnerability of making what they had done available to others. Thanks also go to Dr. Roger Kruez and Dr. Elliott Casal for sharing their experiences with AI. Their perspectives shine a spotlight on current issues that have, and will continue to, alter the landscape of developing research. At its core, research is about moving forward, and in this volume, with the help of all of these people, we have attempted to engage with the possibilities inherent in that effort.

With gratitude,

Dr. Sage L. Graham

Editor-in-Chief

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*This paper received a QuaesitUM outstanding paper award

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Publication and Review Process

Cate VanNostrand graduated summa cum laude in December of 2025 with a double major in English and History. She also earned Honors in History, University Honors with Thesis, and Undergraduate Research Scholar designations. During her undergraduate studies at the University of Memphis, she worked extensively under Dr. Benjamin Graham and presented twice at the Works in Progress Symposium. Cate has a strong passion for anything having to do with words and how they are written and interpreted. Her research interests are varied, but she loves talking about ancient history and Roman antiquity, World War II and Cold War Europe, Memphis history, British literature (especially gothic lit and Sherlock Holmes), and creative writing. Cate is currently pursuing an MA in Technical Communication from the University of Memphis.

Cate VanNostrand

Halbstarke: How Jazz Music, American Movies, and War-Torn Teenagers Helped Split a Country

Faculty Sponsor
Dr. Beverly Tsacoyianis

Abstract

This paper examines how American jazz music, films, and cultural exports influenced the political and social tensions that led to the division of East and West Germany. Focusing on the Halbstarke movement—youth labeled "half-strong" in a perjorative manner by their leaders—it explores how German leaders weaponized fears of Americanization to enforce traditional values and control teenage behavior. Through examples of espionage, cultural propaganda, and debates over masculinity and sexuality, this study reveals that the Cold War divide was fueled not only by political ideology but also by deep anxieties over cultural identity. Drawing from Cold War historians and primary sources from 1950s Germany and America, this paper highlights the complex intersection of youth culture, gender, and politics in postwar Germany.

Introduction

To the amateur history buff, the story of how East and West Germany split into two substates can sound, to some, like a "real life" fairytale. East Germany, typically known as the "bad guys", hated the "good guys" of West Germany, and so they built a country-wide wall to keep East Germans from escaping from the bad guys. Thirty years and a generation of socialism-fueled East German oppression later, a foreign stranger came to the land and commanded that the wall be torn down. The walls came tumbling down, and the people of Germany were reunited. It's the quintessential "happily ever after" story, and has been told via different mediums, whether movies, comic books, or novels.

But the true story behind the Berlin Wall is much more complex than its fictional counterpart. A closer examination of 1950s Germany's political climate reveals that East and West Germany had already existed since 1948, and that their creation had less to do with black-and-white morality and rather had to do with a war of raging political ideals, caused in part by the breaking of societal norms. At the heart of it all, it mainly came down to the output of American culture into German culture and politics, and how West and especially Eastern Germany viewed their countries' Americanization as a threat to their people.

This paper primarily focuses on the Halbstarke movement and Halbstarke teenagers; the German term characterizes teenagers who adopted American fashions like leather jackets and ducktail haircuts, and who frequented the dance halls where they danced the boogie-woogie and jitterbug to jazz and rock and roll music, often shying away from adult supervision. Authorities on both sides dismissed them as delinquents; as they were neither fully rebellious nor fully conformist, they were coined as Halbstarke, or "half-strong", whose visibility exposed the fragility of postwar German identity.

The Halbstarke movement intensified the political division between East and West Germany by exposing fundamental disagreements over cultural identity, sexuality, and national values. Through examination of government documents, film, and contemporary debates over American cultural influence, I argue that the Cold War divide was as much cultural as ideological.

A Neighborhood of Voluntary Spies

Examining 1950s Germany's perceived cultural 'threats' invading the country from within requires setting aside visions of idyllism and innocence. Germany was a war-torn country, its economy having been destroyed by its crushing defeat in both World War I and World War II. Now, the country was trying to rebuild its heritage from scratch, wanting no further intervention from either the Communist party in the USSR or the encroaching capitalist ideology of the United States.

However, both forces were extremely powerful, and both had different goals for Germany's contribution to the world economy post-WWII. The US wanted Germany's economy to recover after paying such a high toll for war, and reparations to the Soviet Union. Stalin, on the other hand, treated Germany as a resource for the restitution and recovery of the Soviet Union. The result was political chaos. Germany buckled underneath the political stress, and the country was unofficially split in two in 1948. West Germany leaned more towards capitalism and more progressive ideals, and East Germany stuck with its socialist tendencies and its desire to stick to more traditional values. The combination made for a tense compromise in the battle against culture, and specifically, against the reforming ideas of sexuality among German people and especially among German youth.

But even the compromise couldn't stand the test of time, and it wasn't long before the county had unofficially divided; national espionage soon escalated from a passing rumor to committed crimes. A 1955 American newspaper reports on the growing spy situation in Germany, highlighting how a supposed German-American man hailing from Chicago was really an Eastern German spy[1]. A 26-year-old redhead named Rosalie Kunze was arrested by the West German government after "fleeing" East Germany, while providing East German officials with secret documents. A Time Magazine article from 1961 further explains the reason that the attractive redhead "Pretty Rosalie" would commit espionage: "In another case of blackmail, an East German girl named Rosalie Kunze was forced to serve as a spy in Bonn's Ministry of Defense or risk exposure of her recent abortion; for months, as secretary to the deputy chief of West Germany's navy, she pumped classified documents to the Communists." [2]

While Kunze served four years in prison for her spying, her arrest and confession led to the arrest and conviction of at least six Communist spies living in West Germany. The Kunze case reveals how cultural and political anxieties became inseparable in Cold War Germany. The blackmail of a woman for her past from East German officials—using her sexual behavior as leverage for espionage—demonstrates how authorities viewed personal morality, sexality, and political loyalty as intertwined threats. The fact that an abortion could serve as blackmail material also shows how deeply traditional sexual values were enforced, even as authorities claimed their primary concern was political ideology. Espionage cases like Kunze's were symptoms of the deeper cultural war brewing between East and West.

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[1] "The Spies' Aim: A German Takeover," This Week (New York, March 12, 1963).

[2] Time Magazine. 1961. "Espionage: The Biggest Net." Time. https://content.time.com/time/subscriber/article/0,33009,895762-3,00.html

The Lonely Crowds - German Teens and Jazz

Jazz reached German youth through multiple channels: American Armed Forces Network radio broadcasts, black market records, and most visibly, the dance halls and clubs that populated cities like West Berlin, Hamburg, and Frankfurt. On weekend nights, teenagers packed into these venues, ranging from small basement Lokale to larger public dance halls, to dance the boogie-woogie and jitterbug, often to live bands. The scene was widespread enough to alarm officials at the highest levels. City councils debated shutting down dancing clubs, and moral reformers issued pamphlets targeting these spaces specifically. This was not a fringe subculture confined to a single city or class, but a visible, cross-class movement that neither East nor West German authorities could ignore.

In her 2000 book Jazz, Rock, and Rebels, historian Uta G. Poiger examines how jazz and American "young rebel" movies affected male teenagers in Germany and how German officials reacted to the shockwave of Americanization. She notes how German superiors viewed jazz music with disdain: "The jazz fans' fashions and dances ran counter to West German visions of male and female respectability." [3] Among her primary sources are films, posters, and didactic material from the East and West German governments as well as the publications of German theorists decrying these threats to the nation. She describes how a West German education manual heavily discouraged American dancing among German men, warning them that they needed to "restrain themselves, sexually and otherwise, in order to reach full manhood." [4] This is just one example of how sexuality was perceived by German adults at the time.

It is worth noting that scholarship on the Halbstarke, including Jazz, Rock, and Rebels, focuses largely on official responses and cultural representations rather than on the testimony of the teenagers themselves. Oral histories and memoirs from this generation remain underexplored in English-language scholarship, which means these young people have largely been interpreted through the lens of those who feared them rather than heard in their own words. This gap is itself revealing; even in the historical record, the Halbstarke were defined by their authorities rather than by themselves.

It's also worth noting that, while absent from many official critiques—unless being portrayed in a mostly negative light—there was the question of race. Jazz was not simply American music—it was African American music, born from

[3] Uta G. Poiger, Jazz, Rock, and Rebels: Cold War Politics and American Culture in a Divided Germany (Berkeley, Calif: Univ. of California Press, 2000), 57.
[4] Poiger, Jazz, Rock, and Rebels, 57.

the blues and shaped by Black musicians like Louis Armstrong, Bessie Smith, and Charlie Parker. Poiger observes that German authorities' anxieties about jazz were deeply racialized; its association with Blackness made it doubly transgressive in a country still reckoning with its own racial ideology. When critics deployed language of castration and emasculation, they were not reacting solely to American cultural influence, but they were reacting to what they perceived as the presence of Blackness in German culture. The "barbarization" that East German officials feared was, in part, a racialized construction, even when race was unnamed. "Whiteness" and "Blackness" as social constructs were actively being negotiated in these cultural debates, and the panic surrounding jazz only makes full sense when read through that lens.

Poiger shares critic Theodore Adorno's harsh words towards jazz, written in vehement opposition to West German critic Joachim Berendt's 1950 piece defending jazz in his scathing 1953 assessment: "'Give up your masculinity; let yourself be castrated,' the eunuch-like sound of the jazz band both mocks and performs, 'and you will be rewarded, accepted into a fraternity which shares the secrets of impotence with you.'" [5] The sexual panic in Adorno's critique is striking—consider the hysterical language used. "Castrated," "eunuch-like," "impotence" are all words that reveal the anxiety surrounding jazz music. By framing jazz appreciation as literal emasculation, Adorno made cultural consumption a matter of sexual and national identity. His rhetoric suggests that listening to American music didn't just reflect poor taste, it threatened German manhood itself. This conflation of cultural choice with masculine identity would become a recurring theme in more official critiques of Americanization, as authorities struggled to reassert control over youth who seemed immune to traditional appeals to national pride.

Adorno's rival Berendt considered there to be a distinction between serious fans of the jazz genre and men who simply wanted to be in opposition to the "soldier ideal". [6] However, Berendt didn't take exception to these men, or at least tried not to. Invoking the name of the youth from a generation ago that defied the Nazis and listened to swing music during the turbulent 1940s, Berendt encouraged the true fans of jazz to embrace the "Swing-Heinis" outcasts into their group. His idea was for jazz fans of all types to prove their loyalty, and shun any signs of lower-class culture, embracing a more bourgeois demeanor. Berendt's attempt to distinguish "serious" jazz fans from working-class "Swing-Heinis" reveals how even defenders of American culture were reinforcing—or attempting to reinforce German class hierarchies. By insisting that jazz appreciation required bourgeoisie,

[5] Poiger, Jazz, Rock, and Rebels, 143.
[6] Poiger, Jazz, Rock, and Rebels, 145.

Berendt inadvertently validated conservative critics' fears. If even jazz's supporters admitted the music attracted 'undesirable' elements, didn't that prove American culture was corrupting German youth? This internal division among jazz advocates unified resistance impossible and allowed authorities to portray youth culture as both a foreign invasion and a lower-class contagion, which became a potent combination that justified increasingly aggressive cultural policing.

Whatever Berendt's best intentions may have been, West Germans proposed to shut down dances and prosecute dancing clubs in hopes that the boogie-woogie and jazz music—and through them, the rebellious and promiscuous behavior of teenagers—would be put to a swift end. Despite Germany's efficient efforts, jazz continued to ebb in and out of the average German youth's daily circle of musical influence. In 1956, a professor from the Berlin Music Academy used jazz as a way to describe the influences of classical music, drawing off music by Louis Armstrong, Bessie Smith, and Charlie Parker. Jazz never really left either side of Germany; on the contrary, telling German adolescents they shouldn't listen to jazz only further increased its consumption on both sides of the nation. It was nearly a repeat of the Swing Jugend movement of the 1940s, a movement where disillusioned and nonpolitical German youth nicknamed the "Swing-Heinis" defied their Nazi authorities by listening to jazz. [7]

This backfire effect reveals a fundamental miscalculation by German authorities: prohibition enhanced jazz's appeal precisely because it was forbidden. By framing American music as dangerous, officials inadvertently made it a tool of rebellion, transforming what might have been a passing fad into a symbol of resistance. The failure of anti-jazz campaigns demonstrated that traditional methods of social control such as censorship, moral panic, and appeals to national identity, were losing their power over a generation that had grown up amid war and occupation. This loss of authority would drive increasingly desperate official responses throughout the 1950s.

The Barbarization of the Boogie-Woogie

Meanwhile on the political warfront, it wasn't long before Germany named the target of their cultural attacks—Americans. More specifically, war-hungry Americans. Both West and East German officials attempted to weaponize the fashion and music choices of German youth, as well as the American imports that their youth were being exposed to. In 1950, Kurt Hager, an East German official, said the bouffant hairstyles that teenage men began to sport resembled "the mushroom

[7] Judd, Robin. 2020. ""Swing Heil": Swing Youth, Schlurfs, and others in Nazi Germany." The National WWII Museum . https://www.nationalww2museum.org/war/articles/swing-youth-jazz-nazi-germany.

cloud of an atomic bomb".[8] Hager's atomic bomb comparison was a calculated rhetorical move that linked youth fashion to existential threat. By invoking Hiroshima and Nagasaki—events from only five years past—he transformed teenagers' hairstyles into symbols of American militarism and mass destruction. If German youth adopted American fashion, they were symbolically aligning themselves with a nation capable of atomic warfare. This hyperbolic framing served a dual purpose: it justified harsh crackdowns on seemingly trivial behavior while positioning East Germany as the defender of German youth against American violence. One East German official tried to rally his people against Americans, saying that East German people were defending their "'national cultural tradition' against 'American imperialist ideologies' and against barbarization by the boogie-woogie culture."[9]

West Germany also used their teenagers' susceptibility towards outside influences for their political propaganda, as seen in a 1952 West German pamphlet on movies in the GDR (East German). They claimed that "the exaggerated wealth of Hollywood stars and producers—for decades symbolic of an overheated and overpaid cult of banality—had its equally monstrous counterpart in the Stalinist Filmkultura" [10], West German officials effectively isolated Americans and Soviets in their culture war. This rhetorical strategy allowed West Germany to position itself as the moderate center, equally opposed to Hollywood's 'cult of banality' and Stalinist propaganda. By equating American and Soviet cultural exports as equally monstrous, West German officials could reject both influences while claiming moral superiority. However, this equivalence was unstable, as West Germany remained economically and militarily aligned with the United States, making its sustained criticism of American culture politically complicated. This tension between cultural rejection and political alliance would characterize West German responses to Americanization throughout the decade, as officials tried to accept American protection while rejecting American culture.

Teenage sexuality as a whole is an important topic of dialogue among Cold War Germany historians. Robert G. Moeller's "The Remasculinization of Germany in the 1950s", published several years before Poiger's book, analyzes how the ideologies of German politics were shaped in part "around the axis of gender." [11] The roles of women are not completely ignored in post-Cold War literature. However Moeller touches on it in his work, explaining how, after the second World War, women were allowed the same political rights as men, according to Germany's postwar constitution. Moeller notes that this was an acknowledgement

[8] Poiger, Jazz, Rock, and Rebels, 59.
[9] Poiger, Jazz, Rock, and Rebels, 59.
[10] Poiger, Jazz, Rock, and Rebels, 54.
[11] Robert G. Moeller, "The 'Remasculinization' of Germany in the 1950s: Introduction," Signs: Journal of Women in Culture and Society 24, no. 1 (October 1998): 101–6, https://doi.org/10.1086/495319, 101.

within the post-war West German constituiton that, thanks to their effort in taking over traditionally male-favored roles in the workplaces during WWII, "women had a 'moral right to be valued like a man'". [12] Historian Mark Fenemore also brings women into his discussion on German sexuality during the 20th century. He discusses how differing views on sexuality have caused minority groups to be repressed noting that "Sexuality has thus historically been about the exercise and denial of power as well as the pursuit and enjoyment of pleasure". [13] Fenemore shows the various ways that sexuality throughout the 20th century, especially during Weimar and Nazi Germany, was policed and shaped by cultural and political influences. Women received most of the brunt of Nazi Germany's attacks on sexuality, being forced to undergo involuntary sterilization if they were deemed unfit. And eugenics was by no means a Germany-exclusive movement, as Latin America, Asian and North America as early as the 1920s and 1930s, with women who had cognitive deficits were the first to undergo involuntary sterilization [14]. The first waves of German-oriented feminism did not begin until the 1970s.

Poiger does discuss the subject of youth culture at length in Jazz, Rock, and Rebels (especially when it came to the concept of Halbstarke teenagers). Fenemore also does not shy away from this topic, saying:

> *"Youth culture provides another important site for the study of sexuality. One of the main attractions of the unofficial youth subcultures that sprang up from the end of the nineteenth century was the opportunity they offered for interaction unsupervi sed by adults and the possibility for generating attitudes to sex at odds with those of older society".* [15]

Fenemore identifies the core threat that youth subcultures posed to authorities: autonomous spaces where young people could develop 'attitudes to sex at odds with those of older society.' This unsupervised interaction was precisely what German officials feared about jazz clubs, dance halls, and movie theaters. These were no longer simply venues for entertainment, but spaces where youth could indulge in alternative and potentially harmful behavior beyond adult control. When East and West German authorities cracked down on these spaces, they weren't simply enforcing traditional morality; they were attempting to eliminate

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[12] Robert G. Moeller, "The 'Remasculinization' of Germany in the 1950s: Introduction," Signs: Journal of Women in Culture and Society 24, no. 1 (October 1998): 101–6, https://doi.org/10.1086/495319, 102.
[13] Mark Fenemore, "The Recent Historiography of Sexuality in Twentieth-Century Germany," The Historical Journal 52, no. 3 (August 4, 2009): 763–79, https://doi.org/10.1017/s0018246x09007559, 76
[14] Laura L. Lovett, Conceiving the Future : Pronatalism, Reproduction, and the Family in the United States, 1890-1938 (Chapel Hill; The University of North Carolina Press. 2007), 143-144.
[15] Mark Fenemore, "The Recent Historiography of Sexuality in Twentieth-Century Germany," The Historical Journal 52, no. 3 (August 4, 2009): 763–79, https://doi.org/10.1017/s0018246x09007559, 769.

the physical locations where youth could develop independent sexual and cultural identities.

Fenemore also shows the differing views on how East and West German teens differed in their approaches, as West German teens fully embraced sexual rebellion via deliberately "drawing attention to their sexual freedom" [16], while East German teens channeled their sexual interests in more "traditional" ways. Youths' worldviews on sex, gender roles, and where men and women stood in the balance were changing. But for 1950s German youth, American influence on traditional gender norms was not as alarming to the teenagers as it was to their political leaders.

Another point of discussion is what side of the fence Poiger and her contemporaries are talking about. In 1961, a wall officially separated the substates of West and East Germany, but both were already almost as different as night and day. Poiger discusses West Germany's attempts to cut down on the Americanization of their country, and she also touches on East Germany's various reactions to the adolescent-caused, rebellion-fueled crazes surrounding the release of movies like Blackboard Jungle, The Wild Ones, and Rebel Without a Cause. Rock stars like Bill Haley and Elvis Presley also incited frustration with their seemingly promiscuous songs and movies (though it's worth noting that both artists were fairly conservative in real life, especially Elvis, who was also deeply anti-communist in the 1960s).

Films have been really effective primary sources in the analysis of East and West German perceptions of identity. John E. Davidson discusses the cinematic divide of Germany at great length in his book, Framing the Fifties: Cinema in a Divided Germany . In Chapter 8, "Visualizing the Enemy", he provides the readers with examples on how one short film titled Zwei Städte (translated as "A Tale of Two Cities") shows the American occupation of Germany in a positive light.

The overtly polemical voiceover is illustrated by the film's montage effects. For example, fast wipes endow the East German propaganda posters with an aggressive character. By contrast, the slow dissolve from a bombed-out residential street in Stuttgart shortly after the war to its reconstructed appearance in 1948 conveys the sense of harmony restored. This scene also defines the time period of the American occupation: 1945 stands as a starting point for the reconstruction project in the West and its accompanying myths of a Zero Hour and a new beginning. The future belongs to the Western Zone, whereas the Eastern Zone remains hopelessly tied to the past through the lingering traces of the war and the presence of propaganda. [17]

[16] Mark Fenemore, "The Recent Historiography of Sexuality in Twentieth-Century Germany," 770.
[17] Davidson, John E. and Sabine Hake, eds. 2007. Take Two: Fifties Cinema in Divided Germany. n.p. Berghahn Books

This cinematic narrative served a crucial political function by transforming economic recovery into moral superiority. By contrasting the 'harmony' of Western reconstruction with the 'aggressive character' of Eastern propaganda, the film suggested that capitalism wasn't just more prosperous, but that it was more peaceful, more natural, and more aligned with German values. The visual language reinforced the message that slow dissolves connoted organic growth in the West, while fast wipes suggested violent disruption in the East. Films like Zwei Städte didn't just report on Germany's division, but they actively constructed it, giving audiences visual proof that East and West were fundamentally incompatible.

Conversely, East German films attempted to inoculate their audiences against Western appeals. Der Weg nach oben (translated as "Room at the Top") is one such film, portraying West German life as "a world of beautiful illusions [18]". This rhetorical strategy was essential for East German authorities because they couldn't compete economically. So instead, they had to reframe their economic disparity as spiritual superiority. If West Germany's wealth was illusory, then East Germany's austerity was authentic. These cinematic narratives competed to such a point that by the late 1950s, East and West Germans were literally watching different versions of reality, making reconciliation increasingly impossible.

The Americans Speak Up

Poiger's analysis of how Germany was responding to American culture may prompt readers to wonder what America's response was to these German portrayals. Tensions had reached a new high as American GIs stationed in Germany faced backlash during the height of cultural tensions in the 1950s.

According to the 1956 American newspaper This Week, American soldiers began to face an onslaught in the German media after one soldier threw a grenade into a Munich bar, wounding nine Germans and eight Americans, and seven American soldiers reportedly raped a fifteen-year-old girl in the woods outside of Bamberg. The German newspapers latched onto these seemingly isolated incidents, and blamed the leadership within the US military stationed in Germany for this horrific crime, reporting a drastic increase in GI-related crime and calling the soldiers gangsters and "sex maniacs". [19] One German paper, the "Bild-Zeitung, plastered this glaring question on their front page: "Gl's, is there something the matter with you fellows? Seven thousand MP's have to take you in hand. Because there are fights with German civilians, blood starts flowing. Lifeless bodies are left lying in the streets…". [20] When asked about the potential truth in these allegations

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[18] Davidson, Framing the Fifties, 124. https://chroniclingamerica.loc.gov/lccn/sn83045462/1956-10-28/ed-1/seq- 197/Books.
[19] A.E. Hotchner, "G.I.'s vs Germans: What's All the Trouble About?" This Week, 28 Oct. 1956 https://chroniclingamerica.loc.gov/lccn/sn83045462/1956-10-28/ed-1/seq-197/
[20] Hotchner,"GIs vs Germans"

in 1956, Colonel Wolf, Chief of the Military Justice Branch for the U.S. Army in Europe, called the multiple allegations "just plain nonsense". [21] General Hobson, the Provost Marshal, elaborated, saying, "These troops are better behaved and better disciplined than any I have ever seen… they get into occasional scrapes in these places, but by and large their conduct on the streets and throughout the city is good". [22]

The German media's willingness to sensationalize isolated incidents into a broader indictment of American soldiers reveals how cultural resentment manifested as moral panic. Whether or not GI crime rates actually increased (and American officials insisted they hadn't), German newspapers found a receptive audience for stories portraying American soldiers as 'sex maniacs' and 'gangsters.' This suggests that German anxiety about Americanization extended beyond cultural imports like jazz and movies to encompass the physical presence of Americans itself. If American soldiers embodied the worst of American culture—violence, sexual aggression, lawlessness—then perhaps American culture more broadly deserved rejection. The backlash against GIs thus reinforced broader arguments for cultural isolation.

Going back to Davidson's analysis of the GDR-made film Der Weg nach oben, the creators of the short had plenty of anti-American fuel to add to the fire: "In this context the film also incites anti-American and nationalistic resentments, particularly when U.S. soldiers are shown holding hands with young [German] women". [23] The image of American soldiers "holding hands with young [German] women" was particularly inflammatory because it combined multiple anxieties: American cultural influence, sexual transgression, and female autonomy. These relationships suggested that German women preferred American men, which was a devastating implication for a nation attempting to reassert masculine authority after wartime defeat. Moreover, these pairings were visible proof of American cultural penetration, literally showing Americans entering German society and German families. East German propaganda could point to these couples as evidence that American presence corrupted German values, turned women away from German men, and threatened the integrity of German culture. Whether the relationships were coerced or consensual almost didn't matter—their existence proved that Americanization was succeeding.The scholarship of Poiger, Fenemore, Moeller, and Davidson reveals that Germany's Cold War division cannot be understood through political ideology alone. By examining how authorities weaponized

[21] Hotchner,"GIs vs Germans"
[22] Hotchner,"GIs vs Germans"
[23] Davidson, Framing the Fifties, 124-125

cultural anxieties—particularly around youth sexuality, gender roles, and American influence—these historians demonstrate that the battle for Germany's future was fought as much in dance halls and movie theaters as in parliamentary halls. Their work shows that when East and West German officials reacted so intensely to jazz music and rock and roll, they weren't simply being prudish. They were defending competing visions of German identity against what they perceived as existential cultural threats.

Conclusion

To the average observer, the story of the Berlin Wall remains a simple narrative: authoritarian East Germany imprisoned its people while democratic West Germany offered freedom. But this binary obscures the complex cultural forces that made division seem necessary to leaders on both sides.

This paper has demonstrated that cultural anxiety was not a peripheral concern but a driving force behind Germany's division. By examining how East and West German authorities responded to American cultural imports—particularly jazz music, youth fashion, and films. This analysis reveals that official fears of 'barbarization' and emasculation were powerful enough to justify increasingly authoritarian measures. The Halbstarke movement threatened not just traditional values but the very legitimacy of authorities who claimed to represent authentic German culture.

The story of Germany's division is ultimately a story about the limits of cultural control. Despite aggressive propaganda, censorship, and moral panic, authorities on both sides failed to stop their youth from consuming American culture. This failure revealed that Cold War divisions were not just imposed from above by competing superpowers, but also built from below, as leaders responded to their own inability to control their citizens' cultural choices. The Berlin Wall was the physical manifestation of this failure—a concrete admission that persuasion had been replaced by force. Understanding this cultural dimension and conclusion reveals the Cold War's true stakes: not just competing economic systems, but fundamentally incompatible visions of identity, sexuality, and national belonging.

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Hallah Abu-Atieh

Mormons and Migration: How do the religious and political identities of Latter-day Saints shape their stance on immigration?

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Abstract

Despite being a majority Republican constituency, many Latter-day Saints do not endorse the party's views on immigration, as it contradicts key principles set out in religious teachings and texts. However, with recent heightened immigration enforcement and legislation, many LDS followers are looking to the Church for guidance in these unprecedented times but have been met with shifting or ambiguous answers. This analysis seeks to determine how religion influences political attitudes toward immigration among Mormon elites and Mormon laity. Drawing on two foundational frameworks, I first examine the evolving stance of LDS clergy toward migrants before and after President Trump's return to office. I then consider how the absence of a unified message from Church leaders has led to varying positions among Mormon adherents on the matter. I present two confounding factors, missionary experience and the "outsider" effect, as potential reasons swaying LDS members' political views toward non-native populations.

Introduction

Political Scientists have become increasingly interested in how voters' religious beliefs shape their partisan identification and policy preferences. One group commonly overlooked is the Church of Jesus Christ of Latter-Day Saints, or Mormons. One reason for the lack of attention in this area may be that Mormons overwhelmingly self-identify with the Republican Party. According to a 2024 Pew Research Center report, 75% of Mormons identify with or lean toward the Republican Party, compared to 23% who favor the Democratic Party ("Changing Partisan Coalitions," 2024). This lack of diversity among Mormons in terms of their party affiliation makes it difficult for researchers to decipher whether LDS political actions stem from their strongly held religious convictions or partisan cues.

While Mormons represent a significant unified voting bloc of the Republican Party, LDS church teachings and sacred texts regarding immigration do not always align with the strict policies and aggressive tactics of the current administration. With heightened immigration enforcement activity in residential communities, such as the most recent deaths of Renee Good and Alex Pretti by ICE agents in Minneapolis, MN, many Americans are witnessing the impacts of federal policies close to home in real time. Pope Francis himself declared the Trump administration's "plan to deport millions of migrants a 'disgrace' … and 'major crisis' for the U.S." (McElwee, 2025). Before his passing in April, the pontiff implored "all the faithful of the Catholic Church ...not to give in to narratives that discriminate against and cause unnecessary suffering to our migrant and refugee brothers and sisters" (McElwee, 2025).

In the same vein, many Mormon parishioners are looking to the Church for guidance on how to navigate these unprecedented times and how their faith instructs them to respond. Understanding how Mormon clergy and laity's religious views define their feelings toward current immigration policy is relatively new territory for scholars who study the role of religion in political behavior (Perry, 2015, p.3). For instance, in Luke Perry's 2015 review of the 2014 book Seeking the Promised Land: Mormons and American Politics by Campbell, Green, and Monson he points out that their "innovatively researched book is now the centerpiece of a small but growing body of literature on Mormons and American politics (Perry, 2015, p.3). Therefore, newfound conclusions are of interest to party leaders who have come to rely on consistent votes from this constituency in elections.

After explaining my theoretical frameworks, I will apply them to both Mormon elites and Mormon laity, analyze relevant studies, and draw conclusions about how religion has versed LDS attitudes towards immigrants and immigration regulations over time. I expected to find that in the past, when immigration was not such a salient wedge issue, and people had greater autonomy to live freely without immediate repercussions, Mormon leaders' religious and moral worldviews more directly framed their preferences about the matter. However, today, with the increased pressure of white Christian Nationalist ideology coming from the White House and the substantial social pressures online to conform to their definition of "Americanness," the role of spirituality in political participation among the Mormon clergy has shifted. Among Mormon laity, I anticipated seeing a comparable transition in how religion influences their political outlook. However, I discover that other confounding factors at the congregational level may amplify the leverage of their ethical vantage point on such issues. I conclude my literature review with a prospective look into the future of the LDS Church and recommendations for further research on these topics.

Theoretical Frameworks and Hypotheses

At the heart of my research is the question of how religion shapes political views – something political behavior scholars have attempted to address through various frameworks or approaches. One such framework presupposes that an individual's personal religious experience informs their moral worldview, which in turn delineates their political actions. From this perspective, one might assume that a Mormon's opinion on immigration policy and enforcement would stem from strongly held virtues and norms precipitated by the religious tenets of the LDS Church.

There are some clues in official church statements that might offer insights into how faith underpins personal philosophy regarding attitudes toward immigration. For example, the LDS Church's official published creed, as of January 2025, emphasizes "love, law, and the family unit" as its highest priority, not only as a reflection of its theology but also as a standard for its shared conduct ("Church Reaffirms Immigration Principles," 2025). Platitudes such as "love thy neighbor" and the value placed on the nuclear or extended family speak to their rational and compassionate interpretation of this situation. The LDS are popularly recognized for their care of those in need and their dedication to missionary work abroad through the Gospel. As of 2024, the Church of Jesus Christ of Latter-day Saints reports having spent "$1.45 billion" on "global humanitarian projects, donations of food and other goods, and services from welfare and self- reliance operations," both domestically and internationally ("Caring for Those in Need," 2024, p.16). With over "6.6 million hours volunteered" and "3,836 humanitarian projects" completed in 2024 alone, Mormon giving is largely unmatched ("Caring for Those in Need," 2024, p.16).

Despite these acts of charity and goodwill, as a faith community broadly, Mormons have shown little outright political support for immigrants since President Trump's second term in office and subsequent crackdown. This choice could be, in part, because the LDS are strictly against infringing upon or breaking rules and regulations. According to the foundational doctrine of the Church, The Articles of Faith, Mormons strongly "believe in being subject to kings, presidents, rulers, and magistrates, in obeying, honoring, and sustaining the law" ("The Articles of Faith," n.d.). Such a creed could override their philanthropic approach to caring for undocumented immigrants. Future survey research could examine whether the saliency of these two core LDS beliefs have varying implications on immigration policy attitudes at the congregational level.

A second theoretical framework that political behavior scholars use to understand how religion shapes political actions is to examine the interactive effects of Christian Nationalist ideology. According to Nilay Saiya's 2025 journal, "The Varieties of American Christian Nationalism," she defines the term as "a political theology that seeks a privileged place for Christianity in American public life" (Saiya, 2025, p.1). With this model, religion matters politically, not necessarily as a belief system, but as a symbolic identity tied to the nation itself. From this perspective, scholars look for signs that one's religious identity has become synonymous with "Americanness," which allows in-groups to create boundaries between who is a "real" American and who is not. President Trump and his administration have embraced and even encouraged a vision of America that divides "real" – white and Christian – Americans from foreigners and immigrants, often referred to as "invaders" (LeVine & Sacchetti, 2023). Through both his in-person speeches and social media posts online, Trump consistently uses inflammatory rhetoric toward immigrants, claiming they are "poisoning the blood" of the country (LeVine & Sacchetti, 2023). The President also famously contended that immigrants "in Springfield, Missouri, [were] eating the dogs, the people that came in, [were] eating the cats. [They were] eating the pets of the people that live there" (Herman, 2024). Beyond that, according to the White House's 2025 article "President Trump's Top 100 Victories for People of Faith," he boasts having brought "back religion in our country," noting that "for America to be a great nation, we must always be one nation under God," which exists as a primarily Judeo-Christian value ("President Trump's Top 100," 2025).

When applying this framework to the topic of Mormons and immigration attitudes, we might investigate whether the Trump administration's statements above, which foster a distrust of racial and ethnic minorities, has had an impact on the LDS' conceptions of and sentiments towards migrants. With the President's heightened depiction of undocumented foreigners as violent, murderous, criminal "invaders," it may be that Mormons are feeling pressure to back off their public stance in favor of non-natives and refugees to show their "Americanness." As a tradition, the LDS faith has long been perceived as non-Christian by other Americans. At a public favorability rate of "15%," Mormons may feel the need to conform to the white Christian Nationalist definition of what it means to be an American, thus reinforcing their Republican party identification and solidifying the choice to avoid overt expressions of support for immigrants ("Americans Feel More Positive," 2023). Coupled with an increased presence on social media and the reality that speaking out or choosing the "wrong" side can lead to further social excommunication in what we know as "cancel culture," the expectation to stay under the Republican banner becomes more crucial.

Drawing on a religious-moral worldview and an interdimensional Christian Nationalist framework, I develop a line of inquiry to explain the existing dichotomy between the Church's doctrinal principles and its outward approach to immigration. The interplay of these dynamics has a distinct meaning for every individual Mormon; however, they offer insight into the perceived predictors of how they will likely navigate the matter. With both in-group and out-group implications tied to their actions, the LDS hang in a delicate balance between their spiritual lives and public image.

Shifts Among the Mormon Elite

Among Mormon elites, I argue that there has been a change over time in the way religion has influenced their political beliefs regarding immigrants and immigration policy. This modification is most evident during the period from before President Donald Trump's first term through his current second term in office. For a more in-depth exploration of this shift, I turn to Robert Welch's 2024 study, "Strangers and Foreigners or Fellow Citizens with the Saints?" To gain insight into the LDS's regard for non-native communities, Welch examined all addresses delivered at the Church's General Conferences from 1851 to 2019 that mentioned immigration, migration, or migrants. He found that from 1850 to about 1940, there were few mentions of these topics; however, most remained relatively favorable toward immigrants and aimed to offer balanced advice guided by the Gospel. Mormon leaders seemed to draw on their origins of alienation in American society and their strongly held commitment to charity to sympathize with the precarious circumstances of many foreigners, reassuring them that the same blessings of the Gospel would come to them as well, regardless of location. This historical precedent is consistent with my hypothesis that their religiously based moral worldview and outsider perspective are more salient when it comes to political interpretation of immigration before Donald Trump.

We start to notice a difference in the language of LDS leadership leading up to President Trump's first term in 2017, indicating a willingness to directly challenge some of his more anti-immigrant reforms and perhaps an increase in the relevance of their outsider status. After Trump's reversal of DACA and a series of conflicts at the U.S.-Mexico border, LDS clergy released a statement to demonstrate their ongoing commitment to DACA recipients, also known as "Dreamers", in their fight for residency and equality. "Dreamers have demonstrated a capacity to serve and contribute positively to our society, and we believe they should be granted the opportunity to continue to do so" ("Deferred Action for Childhood," 2018).

While this brief from LDS higher-ups does appear to serve as an early, direct rejection of one of Trump's anti-immigrant platforms, I reason it is still consistent with their religiously based moral worldview, but perhaps more so derived from their own identity as the "odd man out" in American society. Dreamers, for example, came to the United States as children with no legal status. DACA provided a legal pathway for young people to remain in America, attend school, and work legally. Although not born in the United States, Dreamers obeyed the law and contributed to their community – a distinction other groups of perceived outsiders might logically connect to their own status in society. The Mormon elite, in this case, demonstrated their support for a law that they wanted to remain on the books (i.e., not encouraging lawlessness) and emphasized that a minority group does have the capacity to bring value to the country.

This outcome may indicate the increased prominence of Mormons' marginal position in the United States, which could potentially lead to greater solidarity with other minority groups subject to federal administrative actions. However, I contend that, instead, political officials, particularly in the Republican Party, are seeking to envelop anti-immigration legislation in white Christian Nationalist ideology, effectively pressuring their co-partisans to comply and conform to maintain their sense of "Americanness."

Officials in the Church appear to have embraced this approach during Trump's second term. In January 2025, Donald Trump returned to the presidency after being reelected by American constituents following his loss to Joe Biden in 2020. During the transition, he issued a wave of Executive Orders that attempted to reshape the country and to set forth his conservative agenda, much of which expressed language consistent with Christian Nationalist ideals. For instance, in President Trump's January 20, 2025, Executive Order entitled "Ending Radical and Wasteful Government DEI Programs and Preferencing," he sought to overturn Executive Order 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government' ("Ending Radical," 2025). Within a matter of a single signature, President Trump removed the resources and safeguards put in place by the government to protect the advancement of racial and ethnic minority communities in the U.S., which largely includes immigrants. This presidential directive effectively shut down countless diversity, equity, and inclusion initiatives across the country in federal departments, schools, businesses, and churches. Beyond that, Trump uses harmful language to describe these programs as "radical" and "wasteful," which closely aligns with Christian Nationalist jargon and adjoining beliefs ("Ending Radical," 2025). As a result, many organizations in the public and private sectors had to make changes overnight to remain in compliance with this standard; otherwise, they faced termination.

Just ten days after the initial Executive Order, the overarching Mormon ministry published astatement titled "Church Reaffirms Immigration Principles: Love, Law and Family Unity." According to the bulletin, the Latter-day Saints explain that:

> *As disciples of Jesus Christ, the following principles guide the Church's approach:*
> 1. *The Church of Jesus Christ of Latter-day Saints obeys the law.*
> 2. *We follow Jesus Christ by loving our neighbors. The Savior taught that the meaning of 'neighbor' includes all of God's children.*
> 3. *We seek to provide basic food and clothing, as our capacity allows, to those in need, regardless of their immigration status. We are especially concerned about keeping families together ("Church Reaffirms Immigration Principles," 2025).*

This narrative reflects the LDS's attempt to act in accordance with Trump's executive orders and national agenda without contradicting them in any way. It feels intentional that the very first point emphasizes that the Church will follow the rules laid out by Trump. Meanwhile, the other priorities generally highlight the LDS' moral obligation to charitable causes and acts of amity. What is missing from this release is any mention of how this overturning will negatively impact immigrant populations, nor is there a rejection of the "us-vs-them" terminology implemented to promote such changes.

The Mormon elite face a challenging task of remaining true to the church's orthodoxy and navigating the larger societal perception of their community as "non-Christian" outsiders. This message from 2025 was not only a public declaration, but also a directive for Mormon laity. To them, it connotes a continued dedication to philanthropic efforts whilst providing clear instructions for comply-

Shifts among the Mormon Lay Community

In this section, I examine how religion influences the political behavior of the Mormon lay community. Just as we saw with the LDS leadership, Mormon adherents must balance their secular and non-secular lives as they search for their place in the greater societal context. LDS parishioners strongly identify with the Republican party at a rate of 75%, which endorses a much more explicit angle on immigration than their own church has provided in the previous statements ("Changing Partisan Coalitions," 2024). In contrast, a wide scope of opinions and responses exists among local Mormon congregations on this matter, with some relying on a religiously based ethical worldview and others on a recommitment to their partisan identity.

This dichotomy, which pits politically minded and religiously minded individuals against one another, has shifted from being solely ideological to manifesting in local interactions among Mormon and migrant populations. The former, rooted in party loyalty, appears among the actions of Brigham Young University as they "shut down its 'Dreamers' resource hub for undocumented students [last January], after facing backlash from state leaders who complained that their tithings were being used for illegal immigrants" (Li, 2025). Many white, Republican LDS followers similarly exist on this extreme, showing compassion to individual non-native brothers or sisters in their ward, but simultaneously "condemn[ing] all immigrants" to the general public (Li, 2025).

On the other end of the spectrum are individuals acting under the premise of their religious background and moral obligations. For example, there are Mormons with migration backgrounds who laud the Church for its emphasis on "loving thy neighbor" and on keeping the family together. There are some who are calling for the church to take a clearer stance that outlines ways to keep places of worship a "safe haven for all – including undocumented brothers and sisters" (Kemsley & Stack, 2025). Others, such as Victoria Gomez, a Mormon daughter of a Mexican immigrant family, are calling the LDS' release on 'Love, Law, and Family Unity' "self- contradictory" (Kemsley & Stack, 2025). She argues: "If we really do care about undocumented immigrants, then we cannot be siding with harmful laws" (Kemsley & Stack, 2025).

As an organization, the LDS Church represents over 17.2 million members worldwide, meaning it must cater to this range of ideas if it claims to be emblematic and welcoming to all. In the absence of a strong statement from LDS leaders about how their theology should inform their views about immigration policy, the laity must lean on their own understanding and experiences with migrant communities to govern how they proceed in the face of this ever-evolving social climate.

Other Factors of Variation Among LDS Churches

When investigating whether the average Mormon layperson relies on their religiously based moral worldview or partisan ideology to form an opinion on immigration, we must explore congregational-level features that may amplify or subdue these effects. At the local level, it may depend on the characteristics of the individual's background in their religious institution.While this manuscript does not offer an exhaustive evaluation of these attributes, in the next segment, I consider two confounding determinants, missionary experience in disadvantaged areas and social identity factors, as positions in which Mormons might develop in-group and out-group ties. It is worth noting that Mormons can overwhelmingly support the

Republican party but not necessarily agree with all of President Trump's ideas. The commentary below aims to address the reasons why they may disagree with said ideas.

Missionary Experience

The first element is LDS missions, in which Mormon men and women between the ages of 18 and 25 "choose to spend between 1.5- and 2-years teaching others about the gospel of Jesus Christ" ("Meet the Mormon Missionaries," n.d.). Missionaries serve as full-time volunteers who are placed in areas around the world on behalf of the LDS Church to share and represent the word of the Book of Mormon and the Bible. Berinsky, et al analyze how LDS missions and the location of service affect missionaries' policy views toward undocumented immigrants. They interviewed a sample of 1,084 young people before and after their work away from home across diverse locations worldwide. Along with general data gathered for all missionaries, participants also responded to several political and social prompts, whilst also providing their ideological self-placement and partisan identification.

According to Berinsky, et al, "in general, the opportunity of living in a new location pushed all missionaries in a more liberal direction in their immigration-related policy views" (Berinsky et al, 2020, p.23). They found that after their mission, the more tolerant missionaries were those who helped non-native folks in the United States. And the most tolerant missionaries were those serving in American communities with larger Hispanic populations or those assigned to speak a language other than English.

The figure below from Berinsky, et al reflects this outcome with "missionaries who only served in the US [becoming] about 0.07 points more pro-immigrant on policy-relevant questions than those who went abroad, a difference of more than one-third of the standard deviation of the pre-mission scale" (Berinsky et al, 2020, pp.14-15).

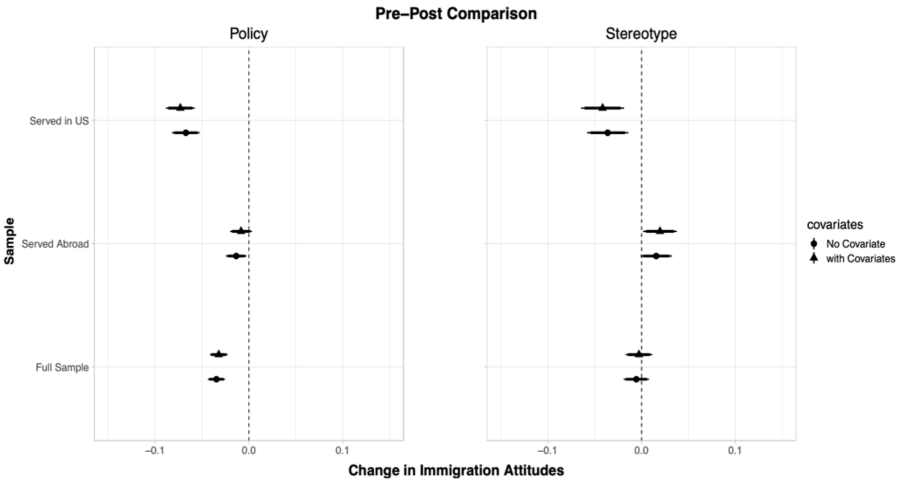

Figure 3

Pre-Post Comparison: Responses to policy-related survey questions. Larger values indicate higher levels of anti-immigrant sentiment. Thicker error bars indicate 90% confidence interval and the thinner ones represent 95% confidence interval.

Source: Berinsky, et al, 2020, p.15

Berinsky, et al demonstrate that a Mormon layperson's context and contact with different cultures affect their political beliefs. They posit that "the experience of living and working with immigrant communities, and in settings where others have positive attitudes about immigrants, induces measurably warmer attitudes toward immigrants that are sustained over time" (Berinsky et al, 2020, p.23). Having the opportunity not only to meet but also to live among and work with the people directly impacted by U.S. immigration policies builds empathy and broadens one's viewpoint.

In conjunction with missionary accounts, there is a significant number of individual members within local congregations who have had favorable interactions with immigrants. For instance, "as part of its Immigrant Services Initiative [in 2021], the LDS Church opened more than a dozen welcome centers throughout North America … to help immigrants and refugees integrate into their new communities" (Pugmire, 2021). With locations in Utah, Texas, Arizona, and Nevada, many local LDS members received the unique opportunity to interact and form relationships with new migrants to the U.S.

Wald, Owen, and Hill (1988) found that the local congregation has a substantial impact on its members' political sentiments, even beyond the individual. Putnam and Campbell (2012) illustrate that social life within a denomination allows people to connect their religious values to political positions in similar ways. I would argue that these efforts, along with the types of missionary activities mentioned above, might redirect the shared standards of local Mormon assemblies and steer them toward a more pro-immigrant angle.

The Outsider Perspective

The second set of factors that may influence Mormon adherents' political attitudes about immigration is their status as a minority religious group in the United States and how that membership reflects into people's character, integrity, and even political mindsets. In this section, I will draw on existing research and apply a common theory developed by social scientists to explain how communal surroundings shape one's identity.

In the late 1970s, social psychologists Henri Tajfel and John C. Turner first introduced the Social Identity Theory, which "explores the relationship between group membership and self-esteem, highlighting how individuals derive their self-concept from both personal and social identities" ("Social Identity," n.d.). Tajfel and Turner delineate that "personal identity encompasses individual traits and achievements, while social identity is tied to group affiliations such as ethnicity, political orientation, and occupation" ("Social Identity," n.d.). Based on these classifications, "the theory posits that individuals categorize themselves and others into ingroups and outgroups" ("Social Identity, " n.d.). Often, humans develop their identity through participation in an "in-group" where norms are shared and reinforced. One's "group," or inner circle has significant control over their ideological leanings. In-group engagement provides positive feelings of belonging, but that often coincides with a distrust, dislike, and bias against the people they deem as their "out-group." This divide tends to foster hatred, misguided stereotypes, and conflict among the two.

Both in-group involvement and aversion to an out-group inform how a person develops and solidifies their own individuality. Mormons, as a minority religious community in the United States, may have a strong in-group bond with fellow churchgoers in their denomination that dictates their principles and political views. Yet simultaneously, they are considered an "out- group" that non-Mormons might have strong antipathetic feelings toward. I will contend that both experiences impact the Mormon laity's political perspectives on immigration.

Mormons have a long history in the Americas as an "out-group." Their story is one of westward migration and rejection by the general public. In the early 1800s, other Americans saw the LDS as heretics who did not respect the separation of church and state, subsequently resulting in them having to flee from their homes and potentially facing violent persecution in several states for their doctrines.

Today, Mormons make up only 2% of the total US population, with 69% of them living in the Western United States, a legacy of their westward migration ("Latter-day Saints," n.d.). Being such a small percentage of the populace concentrated in specific pockets across the United States means that many non-Mormon Americans likely have little or infrequent encounters with the LDS. With little connection between the two entities, many non-Mormons have developed a significant dislike or skepticism of LDS communities. For instance, drawing on conclusions from Campbell, Green, and Monson's 2014 book Seeking the Promised Land: Mormons and American Politics, reviewer Luke Perry underscores that "being Mormon leads to more negative connotations than positive ones" (Perry, 2015, p.2). In fact, according to the Pew Research Center, when asked, "32%" of non-Mormon Americans say that Mormonism is not a Christian religion ("Mormons in America," 2012). "Sixty-eight percent" of non-Mormon Americans say that Mormonism is not mainstream ("Mormons in America," 2012). As of 2022, Pew Research Center reports that "15%" of Americans have a "very or somewhat favorable" view of Mormons, while "25%" of Americans have a "very or somewhat unfavorable" perception of the LDS ("Americans Feel More Positive," 2023). While there has certainly been progress over the past 25 years, animosity still reigns supreme by 10% ("Americans Feel More Positive," 2023).

Among themselves, Mormon assemblies serve as an "in-group" where the values and teachings of their faith are disseminated in service and strengthened in the immediate residential areas around this locus. Individual members develop their own identity alongside their co-religionists. The specific context in which someone creates their character could influence their outlooks on migrants and immigration legislation. For example, as discussed in the previous section, if the local LDS church itself encourages and celebrates missionary efforts in underprivileged communities, that is likely to affect its political judgments on social welfare programs and immigration regulations. This correlation is an intriguing one that warrants further inquiry into the influence of religion on politics in forthcoming studies.

Nevertheless, this dynamic is precisely the mechanism that Knoll examines in his 2009 study titled "And Who is My Neighbor?" In it, he seeks to uncover "why and how religion plays a substantive role in the formation of attitudes regarding immigration reform policy?" (Knoll, 2009, p. 313). While Knoll proposes multiple hypotheses regarding this query, for the purposes of this review, his third proposition is the most relevant. He predicted that members of minority religions in the United States, including Latter-day Saints, would be more likely to support liberal immigration policies than members of other religious groups.

Knoll's journal relied on data from the Pew Research Center and the Pew Hispanic Center's 2006 Immigration Survey. In said survey, analysts asked respondents: "Should illegal immigrants be required to go home (a), or should they be granted some kind of legal status that allows them to stay here (b)?" (Knoll, 2009, p.318). Researchers then used subsequent questions to gauge participants' partisanship and ideological self-identification. Knoll's multivariate investigation found that his hypothesis was supported – members of minority religious groups, including Mormons, were more likely to approve of liberal immigration policies than members of larger religious groups in the U.S. Knoll cites involvement in missionary work and minority religious membership as primary reasons why LDS believers maintain higher rates of affinity toward migrant demographics compared to their non-Mormon counterparts.

In summary, by combining both missionary experience and group identity properties, we can evaluate how specific trademarks of local congregations might influence individuals' presumptions about immigration reform. Mormons understand what it is like to exist as a minority faith and as an "out-group" in the dominant society. This social exclusion is a reciprocal reality among Mormon disciples and among many migrants in the United States. Maureen Craig and Jennifer Richeson's 2016 journal on, "Stigma-Based Solidarity" examines "how perceived discrimination may shape intergroup relations among members of different stigmatized groups" (Craig & Richeson, 2016, p.1). They highlight that "perceived discrimination is … a potentially common experience for members of different stigmatized groups that at times elicits coalitional attitudes but is often solely experienced as a threat to social identity and thus elicits intergroup derogation" (Craig & Richeson, 2016, p.1). The defining line between coalition and derogation comes down to "the dimensions on which individuals are stigmatized, aspects of their discrimination experiences, and [other] contextual factors" (Craig & Richeson, 2016, p.1). As for Latter-day Saints and immigrants, further research awaits whether their joint marginalization could create a degree of familiarity or solidarity between them.

Additionally, according to the Pew Research Center, 43% of Mormon men and 11% of Mormon women have missionary backgrounds in impoverished regions, which Knoll claims has shaped their compassion by putting them in the shoes of immigrants and other "outsiders" ("Mormons in America," 2012). In this way, a shared sense of benevolence toward the foreign cause and mutual identity as fellow "outsiders" could affect individual LDS political views in support of pro-immigrant platforms. However, churches where these characteristics are less prominent may establish expectations in the opposite direction, aligning more closely with the desire to conform to societal pressures to prove their "Americanness," as associated with the Republican Party's more anti-immigrant agenda.

Discussion and Conclusion

With this analysis, I sought to contribute to the ongoing exploration of how religion informs political conduct in the United States. My emphasis on Mormon leaders and laity over time, I hope, provides a novel approach to the use of 'Religious-Moral Worldview' and 'Christian Nationalist' frameworks to understand the often forgotten LDS denomination by behavioral Political Science researchers. Applying these two lines of reasoning can help scholars better grasp how sacred beliefs shape Mormon standpoints on immigration, and how that influence may change over time in response to various external and internal factors.

By examining existing research on this subject through these two hypothetical models, I have developed a new theory to guide prospective studies and subsequent outcomes in the field. I argue that in the past, Mormon elites may have relied more on their religiously based worldview to prioritize charitable efforts intended for immigrant populations. However, as of January 2025, their attitudes may be shifting in reaction to the Republican Party's anti-immigration platform and pressure to conform to the growing white Christian Nationalist ideological definition of "Americanness." In the absence of a strong, centralized message from LDS clergy on how theology should inform policy preferences, we may see an extensive array of perspectives on migrants among Mormon congregants. Therefore, there are significant opportunities to examine whether internal, congregational-level factors, such as missionary experience, "out-group" identity in the broader society, or "ingroup" solidarity, might shape Mormon laity's interactions with non-natives and their sentiments on immigration reform in the United States.

Peter Drucker, an Austrian American author, once said that "in turbulent times, [we] cannot assume that tomorrow will be an extension of today." Given the current Trump administration and unfolding political climate, the relationship between Mormons and migrants will inevitably continue to evolve over the next few years as people react to developments that either pull them together or push them apart. LDS sentiments on these issues are diverging from previous precedents and lack a clear directive for congregants, which, I reason, makes other factors more salient at the local level. Mortensen's 2011 book, entitled The Mormon Church and Illegal Immigration, aptly highlights that a steadfast solution will come once the LDS Church president has spoken directly and unequivocally. The vast majority of constituents will follow his lead, which is why his call holds such authority. Mortensen suggests that there are a few routes the LDS president could take to address this concern.

One option is to continue the current "don't ask, don't tell" policy, which does not ask about immigration status and therefore does not treat it as a problem requiring a response. A more hardline approach, Mortensen offers, is to end missionary work and baptism intended for illegal immigrants and to ask them to return to their home countries to strengthen the LDS presence abroad. A third alternative is to proclaim that "the love of God's Children surpasses adherence to the laws and borders established by man" and to continue baptisms of illegal immigrants, granting them full standing in the Church. Or Mortensen proposes a fourth and final avenue to "quietly suspend all baptisms of illegal immigrants until the federal government changes current legislation." In the meantime, the Church should aim to help migrants maintain a crime-free lifestyle, provide them with resources to live comfortably, and begin the citizenship application process (Mortensen, 2011, p. 17).

Should LDS clergy opt for any of these strategies outlined by Mortensen, social scientists and political behaviorists will have the opportunity to investigate how religion affected these resolutions at the elite level. An official testimony from Mormon leadership could also provide academics the chance to perform a before-and-after study to measure how cues from religious higher-ups dictate the spiritual-based influences on political attitudes among the laity.

Until then, there are endless amounts of research awaiting the areas of immigration and the LDS Church. There are multiple frameworks and methods scholars could apply to inquire about this long-overlooked religious minority in the United States. For example, they could examine the lasting effects of membership in an "out-group" as American political culture continues to embrace increasingly stringent notions of what it means to be American. There is also value in exploring how Mormons view and interact with immigrants domestically and internationally. Most of all, I hope to see a more rigorous study of how various characteristics of local congregations impact their members' political viewpoints.

For too long, researchers have discounted the LDS tradition, which includes over 17.2 million members worldwide. As an international organization, Church officials must strike a balance between strict adherence to the law of the land and the responsibility to welcome new disciples as they integrate into American life now more than ever before. Mormon parishioners also have an obligation to preach the Gospel as it was shared with them, regardless of the storm around them. The United States' broken immigration system is a real issue affecting real people, which means it is a situation we should not take lightly nor ignore completely. Leviticus 19:33-34 states: "When a foreigner resides among you in your land, do not mistreat them ... Love them as yourself … for you were foreigners in Egypt [too]." Ultimately, how the Mormon church interprets this core biblical principle and how it manifests in LDS political stances on immigration should be of interest to us all.

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A Comparison of PTSD Severity Associated with Different Types of Traumatic Events

Faculty Sponsor
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Abstract

Trauma exposure is common, yet post traumatic stress disorder (PTSD) severity varies widely depending on trauma characteristics. This study examined whether PTSD severity differed by trauma type and the developmental timing of individuals' self-identified worst traumatic event. Participants were 636 undergraduate students who reported at least one DSM-5 Criterion A traumatic event. Trauma type was categorized as Child Maltreatment, Interpersonal Violence, Non-Interpersonal Trauma, or Loss/other, and PTSD symptoms were assessed using the PCL-5. Welch's ANOVA revealed a significant effect of trauma type on PTSD severity, such that Non-Interpersonal trauma was associated with significantly lower symptom severity than the other three trauma categories, which did not differ from one another. In contrast, PTSD severity did not differ by developmental timing of the worst trauma (e.g., childhood, adolescence, adulthood). These findings suggest that the nature of the traumatic event may be more important than age at exposure in predicting PTSD symptom severity.

Introduction

Trauma Exposure and Prevalence

Psychological trauma is operationalized in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2022) as exposure to actual or threatened death, serious injury, or sexual violence, experienced directly, witnessed, learned about in relation to close others, or through repeated/ extreme exposure to aversive details of such events by the DSM-5 criteria. Large epidemiological studies consistently find that trauma exposure is the norm rather than the exception. For example, in the World Health Organization (WHO) World Mental Health Surveys, Kessler and colleagues (2017) found that 70.4% of respondents reported experiencing at least one traumatic event, and, on average, participants experienced 3.2 lifetime traumas per person. Despite this high exposure rate, only a small proportion (approximately 7%) of exposed individuals go on to meet criteria for PTSD (Lee & Park, 2018) and less is understood about which trauma-exposed individuals go on to develop PTSD. In the present study, we aim to determine which individuals are most likely to develop PTSD symptoms to inform targeted prevention and intervention efforts.

The Societal Burden of PTSD

PTSD can be a profoundly disabling and chronic syndrome, frequently co-occurring with other psychiatric illnesses such as depression, substance use, and anxiety disorders (Kessler et al., 2017; Grubaugh et al., 2011). Beyond psychiatric comorbidity, many studies have shown that PTSD symptoms increase vulnerability to chronic physical illnesses, particularly cardiovascular and metabolic conditions like hypertension and diabetes (Lee & Park, 2018), further compounding its long-term consequences. This condition imposes a substantial public health burden, with significant loss of "human capital" through reduced work productivity, days out of role, and increased medical service utilization (Kessler et al., 2017; Lee & Park, 2018). The persistent suffering and functional impairment of chronic PTSD exacerbate existing mental health challenges and escalate healthcare expenditures. Although most trauma-exposed individuals do not develop PTSD, those who do suffer disproportionately levels of impairment. As such, PTSD represents a major societal and economic concern.

Previous Studies

Previous reserach has often relied on restricted trauma categorizations that limit regeneralizability. For example, in 2009, Kelley and colleagues studied a sample consisting entirely of women and classified their most salient traumatic experiences into three main categories: sexual assault, motor vehicle accident, and sudden death of a loved one. They found that sexual assault survivors reported the highest overall PTSD severity, with especially elevated symptoms of reexperiencing and emotional numbing, whereas motor vehicle accident and sudden-death groups showed lower but comparable levels. While useful, this classification excluded many trauma types, such as child maltreatment, experiencing a natural disaster, or physical assault, that may also shape PTSD outcomes.

Similarly, in 2011, Grubaugh and colleagues examined the relationship between trauma exposure and PTSD across several demographic factors, but their work was limited to adults with severe mental illness, including schizophrenia spectrum and mood disorders. This focus may obscure the direct association between trauma and PTSD, since comorbid psychiatric conditions can also exacerbate outcomes. They also systematized evidence on PTSD and gender, showing that while overall PTSD rates in men and women with severe mental illness may be comparable, women are more likely to meet PTSD criteria when exposed to sexual assault, whereas physical assault has the strongest association for men.Within this population, the authors highlighted three key findings: PTSD risk increases if the first trauma occurs during childhood, and the risk is higher with cumulative exposure (i.e., the lifetime accumulation of multiple or chronic traumatic events), and more recent traumatic events are strongly associated with symptom severity.

Evidence from general population studies supports and expands these conclusions. For example, in 2017, Dunn and colleagues examined four developmental periods (early childhood, middle childhood, adolescence, adulthood), Ogle et al. (2013) analyzed five life stages (childhood, adolescence, young adulthood, mild life, and older adulthood), and Miller- Graff et al. (2016) focused on age of first exposure and cumulative violent events, collectively showing that earlier developmental exposure predicts greater PTSD risk. Similarly, research demonstrates a “dose–response” pattern: each additional childhood trauma type increases lifetime PTSD risk (Suliman et al., 2009; da Silva et al., 2024), and individuals with greater lifetime trauma accumulation tend to exhibit more severe PTSD symptoms (Kira et al., 2008). In 2016, Briere and colleagues refined this conclusion, showing that cumulative interpersonal trauma is the strongest predictor of PTSD, whereas non-interpersonal trauma does not show the same effect. This aligns with Kessler and colleagues (2017), who reported that although the sudden death of a loved one is highly prevalent, contributes relatively little to PTSD burden compared to rarer interpersonal traumas like rape, sexual assault, or stalking, which disproportionately account for cases despite their lower base rates.

Additionally, in 2010, McCutcheon and colleagues focused exclusively on women and reported that more than half of the participants with assault-related trauma experienced their first exposure during childhood. In their study on women's risk of PTSD, eight trauma types were classified into two broader groups: assaultive traumas (e.g., sexual assault, physical abuse, neglect, being threatened with a weapon or kidnapped, severe physical assault) and non-assaultive traumas (e.g., life-threatening accident, natural disaster, witnessing someone being badly injured or killed). The researchers further examined developmental timing by distinguishing between trauma exposure at age 11 or younger (childhood) versus age 12 or older (adolescence/early adulthood). The results from this study again support previous evidence that sexual trauma carries the highest risk of PTSD in women and that early trauma exposure increases the risk of PTSD (McCutcheon et al., 2010).

Complementing this work, Ogle and colleagues (2013) investigated how both the most distressing single event and the cumulative lifetime accumulation of traumas across developmental stages (e.g., childhood, adolescence, young adulthood, midlife, and older adulthood) influenced PTSD symptoms and psychosocial functioning among older adults. Traumatic events were defined according to DSMIV-TR criteria and classified along four dimensions: (1) A1 vs. non-A1 (whether the event met Criterion A1, involving actual or threatened death, serious injury, or threat to integrity), (2) self-oriented vs. other-oriented (whether the trauma happened to the self, such as assault, versus to others, such as the death of a loved one), (3) interpersonal vs. non-interpersonal (violence/abuse versus illness, accidents, or disasters), and (4) A2 vs. non-A2 (whether the person reported strong emotional reactions of fear, helplessness, or horror at the time, consistent with Criterion A2). Their results indicated that older adults who experienced their most distressing traumas during childhood reported greater current PTSD symptom severity and lower levels of psychosocial functioning, including happiness, social support, and coping ability, than those whose worst traumas occurred later in life.

These findings underscore the enduring impact of early-life trauma, showing that its adverse consequences can persist for decades. Although this framework offered a nuanced understanding of trauma characteristics, the sample was overwhelmingly Caucasian (99.3%) and composed of highly educated older adults with greater cognitive, social, and economic resources, factors that may have mitigated adverse outcomes and limited the cultural generalizability of the findings.

Developmental Timing

Neurodevelopmental theory suggests that there are "sensitive periods" in childhood or adolescence during which stress can have especially pronounced effect on the brain. Both studies of Mandelli and colleagues (2015) and Grubaugh and colleagues (2011) observed that these developmental stages are marked by unique cognitive, emotional, and social changes that shape vulnerability to PTSD beyond sociodemographic influences. For instance, in 2018, Dunn and colleagues noted that because memory is not fully developed in early childhood, traumatic experiences are more likely to be reported as beginning in middle childhood. This raises concerns that observed "sensitive periods" may partly reflect recall bias rather than true developmental vulnerability, thereby complicating conclusions about whether certain developmental windows are inherently more harmful.

In 2023, Li and colleagues extended this perspective by suggesting that specific developmental stages make the brain particularly susceptible to negative experiences through neural plasticity. For example, neglect or abuse periods when the hippocampus and amygdala are maximally sensitive (around age 7 for boys and age 10 for girls) can impair neurogenesis, leading to long-term emotional and behavioral dysfunction. In line with this, Vaughn-Coaxum and colleagues (2018) found that trauma exposure in early life can influence later coping behaviors both biologically through altered HPA axis and prefrontal cortex functioning and behaviorally by increasing threat sensitivity. Together, these findings highlight that early life trauma not only disrupts brain development but also leaves enduring marks on how individuals interpret and respond to stress.

Importantly, while biological mechanisms underlying these effects are increasingly well documented, far less is known about how developmental context interacts with trauma exposure to shape PTSD risk. Moreover, most studies have prioritized the first exposure (Dunn et al., 2017, 2018) or cumulative burden (Copeland et al., 2018; Vaughn-Coaxum et al., 2018), while overlooking the role of subjectively defined "worst" trauma events that individuals perceive as most distressing, which may have a disproportionate impact on psychopathology (Kelley et al., 2009). It is unclear whether the developmental timing of the individuals' self-identified "worst" traumatic events also plays a role in the resulting level of PTSD symptomatology.

The Present Study

Prior research demonstrates several consistent patterns regarding trauma exposure and PTSD. First, studies show that earlier trauma exposure is linked to higher PTSD risk (Dunn et al., 2017; Ogle et al., 2013; Miller-Graff et al., 2016). Second, cumulative trauma with multiple exposures is associated with greater lifetime PTSD risk and more severe symptoms (Suliman et al., 2009; da Silva et al., 2024; Kira et al., 2008). Importantly, cumulative interpersonal traumas have emerged as the strongest predictor of PTSD, particularly compared to non-interpersonal traumas (Briere et al., 2016; Kessler et al., 2017). Third, the recency of of trauma, especially physical and sexual abuse, is associated with heightened symptom severity (Dunn et al., 2018). Gender differences further shape vulnerability, with women at greater risk following sexual assault and men more affected by physical assault (Grubaugh et al., 2011). Together, these findings highlight that trauma type, developmental timing, cumulative number of traumatic events, and gender all play important roles in PTSD risk.

Despite these advances, significant gaps remain in understanding how trauma type and developmental timing jointly influence PTSD. Prior findings have been inconsistent, with some studies reporting that childhood exposure carries the highest risk for PTSD (Dunn et al., 2017; Ogle et al., 2013), whereas others find no unique effect of early exposure once cumulative trauma burden or recency are controlled (Copeland et al., 2018). Similarly, research differs in how it categorizes trauma types. Some studies focus on broad categories such as interpersonal versus non-interpersonal events, while others use narrower or population-specific classifications, making it challenging to compare across studies. Moreover, while cumulative and first-exposure effects have been widely studied, less is known about the impact of individuals' self-identified worst trauma across developmental stages in terms of PTSD symptoms. The present study aims to address this gap by examining the relationship between individuals' self-identified worst traumatic event and their level of PTSD severity, and by testing whether this relationship differs by age of exposure. In doing so, this work seeks to clarify which types of trauma are most predictive of PTSD at different developmental stages, thereby illuminating the joint role of trauma type and developmental timing in PTSD risk.

Previous research has consistently demonstrated that the nature of traumatic experiences plays a critical role in determining the severity of PTSD symptoms (Gould et al., 2021; McLaughlin et al., 2017). The present study aimed to examine how characteristics of traumatic experiences are related to the severity of PTSD symptoms. Specifically, this study investigated whether PTSD symptom severity differed depending on the type of trauma and the developmental timing of the traumatic event identified by participants as their worst trauma. In this study, trauma type (Child Maltreatment, Interpersonal Violence, Non-Interpersonal Trauma, and Loss/Other) and developmental timing of trauma exposure (childhood, adolescence, adulthood) served as the independent variables, while PTSD symptom severity, measured using the PCL-5, served as the dependent variable.

First, we aimed to examine whether PTSD symptom severity differed across trauma types. Based on prior literature indicating an elevated risk for PTSD following interpersonal forms of victimization (Kul & Gündoğmuş, 2020), we hypothesized that individuals who identified Interpersonal Trauma or Child Maltreatment as their worst traumatic event would report greater PTSD symptoms compared to those exposed to other types of trauma.

Second, we sought to determine whether PTSD symptom severity differed according to the developmental period during which individuals were exposed to their worst traumatic event. For each event, participants reported the age at which it occurred. Consistent with previous research, childhood was defined as 0 to 10 years of age (Dunn et al., 2018), and adolescence was defined as 11 to 17 years of age (Tervo-Clemmens et al., 2023). Guided by epidemiological research, patterns observed in our dataset, and prior literature, we defined age 18 as the beginning of adulthood. Based on these definitions, participants were categorized into three developmental groups. We expected that individuals who experienced their worst trauma during earlier developmental periods would report greater PTSD symptom severity.

Third, we hypothesized that the interaction between trauma type and developmental timing would significantly predict PTSD symptom severity. In particular, we expected that exposure to interpersonal trauma or child maltreatment during early developmental periods would be associated with more severe PTSD symptoms compared to similar trauma experienced later in life. Given that trauma exposure is widespread but only a subset of individuals develop PTSD, identifying factors that contribute to greater symptom severity remains an important clinical and public health priority. By examining how trauma type and developmental timing relate to PTSD symptoms, this study may help improve understanding of who is most vulnerable following trauma exposure.

Method

Participants

Participants were 636 undergraduate students at a university in the southeastern United States. This reflects all participants who completed the survey validly and who reported having experienced at least one event that met the DSM-5 definition of a traumatic event. The average age was 20.7 years (SD = 4.73), with ages ranging from 18 to 52. The majority of participants identified as female (77.1%). Regarding racial and ethnic background, 49.7% identified as White, 37.7% as Black/ African American, and the remaining participants identified as another racial/ethnic group or as multiracial. A total of 1,070 college students originally completed the survey. Based on pilot testing and inspection of completion-time patterns, participants who completed the survey in under 25 minutes (n =215) were removed because this was considered too fast to reflect valid responding. Participants younger than 18 years old were also excluded (n = 22), as they were instructed not to participate. Individuals who did not provide a describable worst event (n = 106) were also removed, as well as those whose worst event did not meet DSM-5 Criterion A for PTSD (n = 88). Because the present analyses focus exclusively on civilian trauma exposure, participants who endorsed LEC item 10 (combat or war-zone exposure) were excluded (n =3). After applying all exclusion criteria, the final analytic sample consisted of 636 participants.

Measures

Trauma exposure was assessed using the Life Events Checklist (LEC; Blake et al., 1995), a 17-item self-report instrument designed to screen for lifetime exposure to potentially traumatic events. For each event, participants indicated whether it happened to them personally, whether they witnessed it, learned about it, were unsure, or if it did not apply.When a participant endorsed an event, additional follow-up questions were presented to obtain more detailed information about the most salient traumatic experience and to verify that it met Criterion A for trauma exposure as defined by the DSM-5 criteria (American Psychiatric Association, 2022).

The primary outcome variable in this study was PTSD symptom severity which was assessed using the PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013). The PCL-5 is a 20-item self-report measure designed to assess the severity of PTSD symptoms based on the criteria outlined in the DSM-5. Participants rated how much they had been bothered by each symptom over the past month using a 5-point scale ranging from 0 (not at all) to 4 (extremely). In this study, participants were instructed to respond in reference to the traumatic event they identified as the worst event on the LEC. Item responses were then summed to yield a total PCL-5 score. PCL-5 scores can range from 0 to 80 and higher total scores indicate greater severity. The PCL-5 demonstrates excellent internal consistency and reliability across samples.

Procedure

Participants were recruited from psychology courses at the University of Memphis through the departmental Sona Systems research pool, which provides course credit in exchange for participation. The Institutional Review Board at the University of Memphis approved this study before data collection. Students who chose to participate accessed the study through an online survey link. After reviewing the study information, participants completed an informed consent form before beginning the questionnaires. Participants first completed the Life Events Checklist (LEC) to report lifetime exposure to potentially traumatic events. For events they endorsed, follow-up questions asked them to identify the single worst traumatic event and to report the age at which the event occurred. Participants then completed the PTSD Checklist for DSM-5 (PCL-5), responding to all items in reference to the worst traumatic event they identified.

Based on their LEC responses, participants were assigned to one of four LEC responses, participants were assigned to one of four groups:

1) Child Maltreatment: Defined by Mandelli and colleagues (2015) as any form of abuse or neglect that causes or threatens harm to a child's well-being, including sexual, physical, emotional/psychological abuse, exploitation, or failure to provide necessary care. Such experiences can significantly impair a child's psychological, physical, emotional, and social development. In our study, Child Maltreatment is treated as a subgroup of interpersonal trauma. Because the dataset does not include information on the perpetrator, we classified an event as Child Maltreatment if it was described as physical or sexual assault or "Other unwanted or uncomfortable sexual experience" and if it occurred before age 13, based on epidemiological patterns and prior literature (da Silva et al., 2024).

2) Interpersonal Violence: This category included events that involved (being shot, stabbed, or threatened with a weapon), sexual assault (rape or forced sexual physical assault (being attacked, hit, or beaten), assault with a weapon acts), other unwanted or uncomfortable sexual experiences, or captivity (being kidnapped, held hostage, or imprisoned).

3) Non-Interpersonal Trauma: This category included events that did not involve direct harm from another person but posed a significant threat to life or physical safety. Specifically, events were coded as Non-Interpersonal Violence if they involved a natural disaster (e.g., flood, hurricane, tornado, earthquake), fire or explosion, a transportation accident (car, boat, train, or plane), a serious accident occurring at work, home, or recreation, or a life-threatening illness or injury.

4) Loss/other: This category included events such as severe human suffering, sudden or unexpected death of someone close, or sudden, violent death (homicide, suicide), or any other very stressful event or experience.

Data Analysis

Before conducting primary analyses, variables were screened for accuracy, missing data, outliers, and distributional assumptions in accordance with recommendations by Tabachnick and Fidell (2013). Assumptions of homogeneity of variance were evaluated using Levene's test, and robust statistical procedures were applied when these assumptions were violated. Two one-way analyses of variance (ANOVAs) were conducted to test Hypotheses 1 and 2, examining differences in PTSD symptom severity across trauma type and developmental timing groups. Trauma categories were derived from participants' responses to the Life Events Checklist and follow-up questions regarding their worst traumatic event. Coding was conducted by the research team, using SPSS to automatically apply predefined classification rules derived from prior literature on trauma typologies. Each participant's worst event was categorized into one of four trauma groups based on the type of event and contextual information provided in the survey. For the Child

Maltreatment category specifically, contextual information included the participant's age at the time of the event (coded as childhood if the event occurred before age 13), as well as event descriptions indicating abuse or neglect consistent with maltreatment definitions from prior literature (Mandelli et al., 2015). The research team reviewed coding decisions to verify that each classification adhered to the predefined rules and discussed any ambiguous cases to reach consensus, ensuring consistency with the established criteria. In addition, descriptive analyses were conducted for demographic variables, including gender and race or ethnicity, to characterize the sample. Hypothesis 3 proposed that trauma type and developmental timing would interact to predict PTSD severity. However, preliminary analyses indicated that some trauma categories occurred almost exclusively within specific developmental periods (e.g., Child Maltreatment occurring primarily during childhood). Because these structural data limitations produced empty cells, a two-way ANOVA testing the interaction between trauma type and developmental timing was not statistically appropriate and therefore was not conducted.

Results

Descriptive Statistics for Trauma Exposure

Participants were asked to identify the single "worst" traumatic event they had experienced. As shown in Table 1, the most frequently reported worst trauma was transportation accident ($n = 120$, 18.9%), followed by sexual assault ($n = 92$, 14.5%), sudden, unexpected death of a loved one ($n = 65$, 10.2%), sudden, violent death ($n = 63$, 9.9%), physical assault ($n = 55$, 8.6%), and severe human suffering ($n = 46$, 7.2%). Other commonly endorsed events included any other very stressful event or experience ($n = 42$, 6.6%), assault with a weapon ($n = 41$, 6.4%), life-threatening illness or injury ($n = 40$, 6.3%), and natural disaster ($n = 37$, 5.8%). Less frequently reported worst traumas included serious accident ($n = 17$, 2.7%), fire or explosion ($n = 12$, 1.9%), captivity ($n = 3$, 0.5%), and other unwanted sexual experiences ($n = 3$, 0.5%). All participants reported the worst traumatic event.

Trauma types

As noted previously, trauma exposure was categorized into four trauma types based on participants' self-identified worst traumatic event. Child Maltreatment was reported by 59 participants (9.3%), Interpersonal Violence by 134 participants (21.1%), Non-Interpersonal Trauma by 226 participants (35.5%), and Loss/other trauma by 216 participants (34.0%).

Traumatic Event (LEC)	Childhood (ages 0 - 10)		Adolescence (ages 11 - 17)		Adulthood (ages 18+)		Total (%)	
Natural disaster	6	(6.4%)	20	(6.8%)	11	(4.5%)	37	(5.8)
Fire or explosion	2	(2.1%)	8	(2.7%)	2	(0.8%)	12	(1.9)
Transportation accident	9	(9.6%)	56	(19.1%)	54	(22.0%)	119	(18.8)
Serious accident	4	(4.3%)	9	(3.1%)	4	(1.6%)	17	(2.7)
Physical assault	4	(4.3%)	29	(9.9%)	22	(8.9%)	55	(8.7)
Assault with a weapon	5	(5.3%)	15	(5.1%)	21	(8.5%)	41	(6.5)
Sexual assault	32	(34.0%)	38	(13.0%)	22	(8.9%)	92	(14.5)
Other unwanted sexual experience	0	(0.0%)	1	(0.3%)	1	(0.4%)	2	(0.3)
Captivity	2	(2.1%)	1	(0.3%)	0	(0.0%)	3	(0.5)
Life-threatening illness or injury	6	(6.4%)	15	(5.1%)	19	(7.7%)	40	(6.3)
Severe human suffering	8	(8.5%)	24	(8.2%)	14	(5.7%)	46	(7.3)
Sudden violent death	6	(6.4%)	32	(10.9%)	24	(9.8%)	62	(9.8)
Sudden unexpected death	7	(7.4%)	24	(8.2%)	34	(13.8%)	65	(10.3)
Any other very stressful event or experience	3	(3.2%)	21	(7.2%)	18	(7.3%)	42	(6.6)

Table 1

Distribution of Participants' Most Distressing Traumatic Events (LEC) by Developmental Period, n(%)

Note: Traumatic events were assessed using the Life Events Checklist for DSM–5 (LEC-5). Participants selected their most distressing traumatic event from the LEC-5.

Developmental Timing of the Worst Trauma

Nearly half of participants, 46.1%, reported having experienced their worst event during adolescence (ages 11–17) (n = 293), 39.1% (n = 248) reported having experienced their worst event during adulthood (ages 18 and older) and 14.8% (n = 94) reported having experience their worst event during childhood (ages 0–10). One participant (0.2%) did not report their age at trauma exposure. Table 1 shows that certain trauma types were more commonly reported during childhood, most notably sexual assault, which accounted for approximately one-third of childhood exposures (34.0%). In contrast, events such as transportation accidents were reported more frequently during adolescence (19.1%) and adulthood (22.0%). Other traumatic events were reported across all developmental periods.

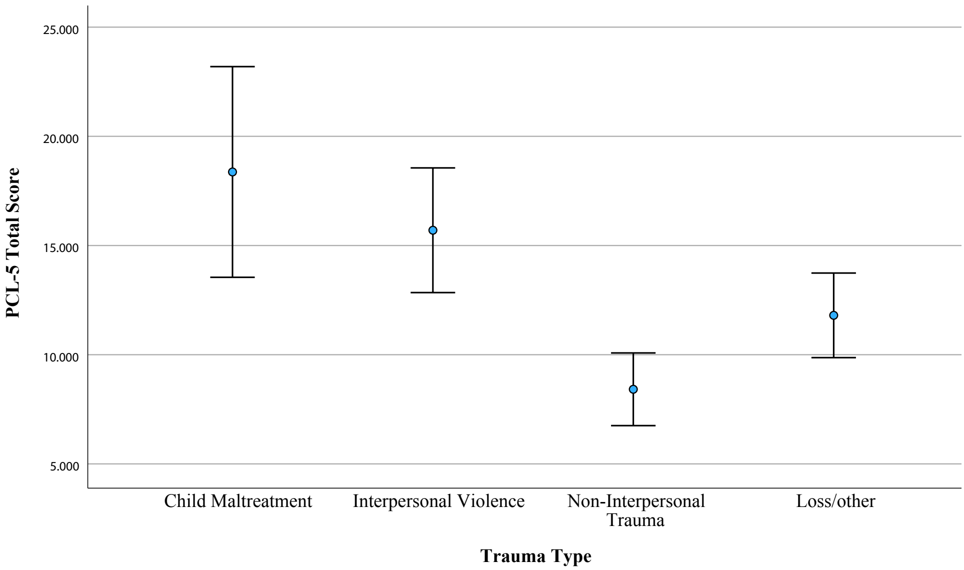

Figure 1

Mean PTSD Symptom Severity (PCL-5 Total) by Trauma Type

Note: Error bars represent 95% confidence intervals. PTSD symptom severity was measured using the PTSD Checklist for DSM–5 (PCL-5), with higher scores indicating greater symptom severity.

Hypothesis 1: Trauma Type and PTSD Symptom Severity

To test Hypothesis 1, which predicted that PTSD symptom severity would differacross trauma types, a one-way between-subjects ANOVA was conducted with trauma type (Child Maltreatment, Interpersonal Violence, Non-Interpersonal Trauma, and Loss/Other Trauma) as the independent variable and PCL-5 total score as the dependent variable.Preliminary assumption testing indicated that the homogeneity of variance assumption was violated, as Levene's test was significant ($p < .001$). Therefore, Welch's ANOVA was used to test group differences.

Results of Welch's ANOVA indicated a statistically significant effect of trauma type on PTSD symptom severity, Welch's $F(3, 198.09) = 9.88$, $p < .001$. This finding suggests that mean PCL-5 scores differed across the four trauma categories (see Figure 1). Effect size estimates indicated a small magnitude of group differences ($\eta^2 = .051$; $\omega^2 = .046$), representing a relatively modest proportion of the variance in PTSD symptom severity.

Post-hoc pairwise comparisons were conducted using the Games-Howell procedure due to unequal variances and group sizes. These comparisons showed that the Non- Interpersonal Trauma group had a mean PCL-5 score that was significantly lower than the other three groups (Table 2). No statistically significant differences were observed among the Child Maltreatment, Interpersonal Violence, and Loss/other trauma groups ($ps > .05$). Collectively, these findings support Hypothesis 1, indicating that Non-Interpersonal Trauma was associated with lower PTSD severity, compared to Child Maltreatment, Interpersonal Violence, and Loss/other trauma.

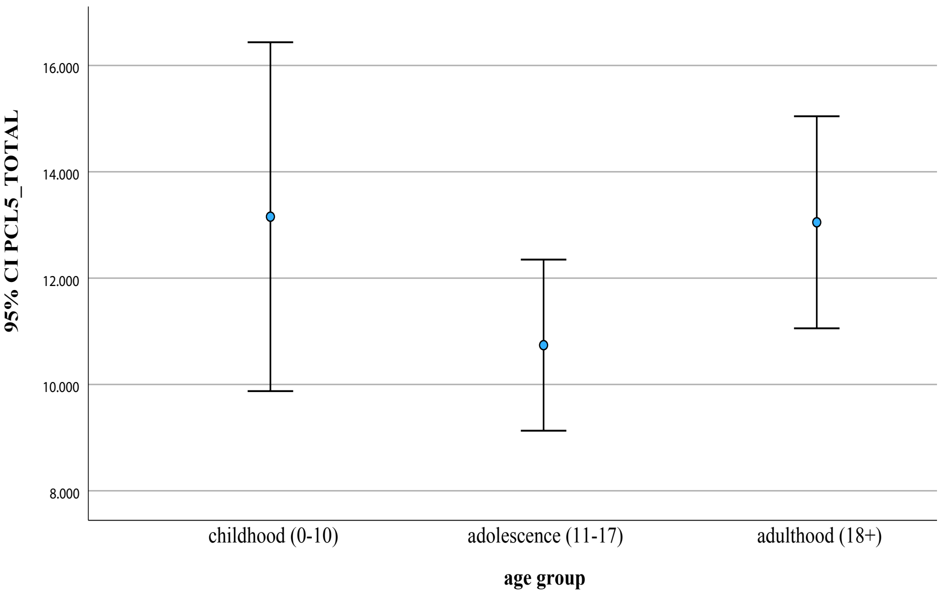

Figure 2

Mean PTSD Symptom Severity (PCL-5 Total) by Age Group

Note: Error bars represent 95% confidence intervals.

PCL-5 Score			
Trauma Type	n	M	SD
Child maltreatment	57	18.37[a]	18.18
Interpersonal violence	123	15.70[a]	15.99
Non-interpersonal trauma	216	8.42[b]	12.41
Loss/other trauma	213	11.80[a]	14.34

Table 2

Mean Post traumatic Stress Disorder Symptom Severity (PCL-5 Total Score) by Trauma Type. Note: PTSD symptom severity was measured using the PTSD Checklist for DSM– 5 (PCL-5), with higher scores indicating greater symptom severity. Means in the same column that share the same superscript letter do not differ significantly from each other.

Hypothesis 2: Developmental Timing and PTSD Symptom Severity

To test Hypothesis 2, we conducted a second one-way between-subject ANOVA to examine whether PTSD symptom severity differed based on the developmental timing of exposure to participants' worst traumatic event. Developmental timing was categorized into three groups: childhood (ages 0–10), adolescence (ages 11–17), and adulthood (ages 18 and 400 older). Assumption testing indicated that the homogeneity of variance assumption was met, as Levene's test was non-significant ($p > .05$). Therefore, standard ANOVA procedures were used.

The one-way ANOVA revealed no statistically significant effect of developmental timing on PTSD symptom severity, $F(2, 606) = 1.90$, $p = .151$. Mean PCL-5 scores were similar across groups, with participants exposed in childhood (ages 0–10) reporting a mean score of 13.16 (SD = 15.66), those exposed in adolescence (ages 11–17) reporting a mean score of 10.74 (SD = 13.68), and those exposed in adulthood (ages 18 and older) reporting a mean score of 13.05 (SD = 15.65). Effect size estimates were small ($\eta^2 = .006$; $\omega^2 = .003$), indicating that developmental timing accounted for a very small proportion of variance in PTSD symptom severity. These findings suggest that the timing of the worst trauma, considered in isolation, was not meaningfully associated with PTSD symptom severity in this sample.

Post-hoc comparisons using Tukey's HSD were non-significant for all pairwise comparisons among childhood, adolescence, and adulthood groups.

These results suggest that PTSD symptom severity did not differ meaningfully depending on whether the worst trauma occurred earlier or later in development. Accordingly, Hypothesis 2 was not supported.

Hypothesis 3: The interaction between trauma type and developmental timing

A two-way ANOVA examining the interaction between trauma type and developmental timing could not be conducted due to structural limitations in the dataset, including empty cells and uneven distributions of trauma categories across developmental periods.

Discussion

The present study examined whether trauma type and developmental timing of trauma exposure were associated with posttraumatic stress disorder (PTSD) severity among individuals who reported their worst traumatic event. The present study examined whether trauma type and developmental timing of trauma exposure were associated with posttraumatic stress symptom severity among individuals who had experienced at least one traumatic event.

The current study used one-way ANOVA tests to examine how trauma type and the developmental timing of trauma relate to PTSD severity. The findings provided partial support for Hypothesis 1. We found a significant effect for trauma type (child maltreatment, interpersonal violence, non-interpersonal trauma, or loss/other) on PTSD severity, and post-hoc comparisons showed that participants whose worst trauma was non-interpersonal trauma had significantly lower levels of PTSD severity than those whose worst trauma was child maltreatment, interpersonal violence, or loss/other. The other three trauma groups did not differ significantly from each other. In other words, non-interpersonal trauma was associated with the lowest PTSD symptom levels, while the other three trauma groups were linked to higher symptom levels.

In contrast, Hypothesis 2 was not supported, as the one-way ANOVA for developmental timing (age of worst trauma: childhood, adolescence, adulthood) showed no significant effect on PTSD severity. Indicating that, for this sample, PTSD severity did not meaningfully differ based on whether the index trauma occurred earlier or later, across the spectrum from early childhood through emerging adulthood. Due to the nature of our sample, we were not able to make comparisons among a full range of ages into middle and later adulthood.

The pattern we observed for trauma type closely matches prior research showing that interpersonal and sexual traumas are associated with higher PTSD severity than non-interpersonal events such as a accidents or natural disasters

(Kessler et al., 2017; Kul & Gündoğmuş, 2020; Smith et al., 2016; Thomas et al., 2021). Longitudinal research also suggests that individuals who experience childhood trauma or interpersonal violence are less likely to achieve remission from PTSD and tend to have longer recovery periods compared to those exposed to non-interpersonal trauma (Chapman et al., 2011). Together, these findings support the idea that interpersonal forms of trauma are more severe and more persistent in their psychological impact.

A likely explanation is that interpersonal traumas involve intentional harm, betrayal, and violation of trust (Birkeland et al., 2021; Reiland & Harrington, 2025). Being harmed by another person can strongly disrupt beliefs about safety, relationships, and self-worth. These experiences may also lead to feelings of shame, guilt, and fear of others. In contrast, non-interpersonal events such as accidents or natural disasters do not usually involve personal betrayal. This may explain why, in our study, the three trauma categories with interpersonal elements (child maltreatment, interpersonal violence, and loss/other) all showed higher PTSD severity and did not differ significantly from each other, while non-interpersonal trauma showed the lowest symptom levels.

The developmental timing of trauma exposure was not significantly associated with PTSD symptom severity in the current sample. Importantly, this finding should not be interpreted as evidence that the timing of trauma exposure is altogether unimportant. Rather, the results suggest that within this specific sample and study design, the age at which participants experienced their worst trauma was not strongly related to current PTSD symptom severity. In the present sample, sexual assault was most frequently reported during childhood and adolescence, whereas transportation accidents were more common during adolescence and emerging adulthood. Meanwhile, other studies have found different distributions of types of trauma. In contrast to some previous research, we did not find that earlier age at trauma exposure (in childhood or adolescence) was associated with higher PTSD symptom severity. Several studies have reported that trauma in childhood, especially interpersonal violence and sexual abuse, predicts more severe and long-lasting PTSD symptoms in adulthood (Nasir et al., 2021; Chapman et al., 2011). These studies suggest that early trauma can disrupt emotional development, attachment, and coping skills, which may increase long-term vulnerability to PTSD. However, not all studies have found a clear effect of age at exposure. For example, Mueller-Pfeiffer and colleagues (2013) and Maercker and colleagues (2004) reported no significant differences in PTSD severity based on when the trauma occurred. Overall, the literature on developmental timing is mixed, and relatively few studies have examined this issue in detail.

There are several possible reasons why we did not find a timing effect in our study. First, our analyses focused on the single "worst" trauma, rather than total lifetime trauma exposure. Previous research shows that cumulative trauma, especially repeated interpersonal violence, strongly increases PTSD severity (Ogle et al., 2014; Da Silva et al., 2024; Chapman et al., 2011). Other studies also suggest that trauma type and cumulative exposure may be more important than timing alone in predicting PTSD severity (Ogle et al., 2014; Hagenaars et al., 2011). Some participants who reported their worst trauma in adulthood may have also experienced earlier traumas that were not captured in our analysis. Without accounting for total trauma load, the effect of timing may be difficult to detect.

Second, individuals differ in recovery and resilience. Some people may recover from childhood trauma over time, while others may develop more severe symptoms after trauma in adulthood. These different recovery patterns could reduce differences between age groups. Third, our developmental categories were broad, which may have masked more subtle differences between specific ages or stages of development. It is also important to acknowledge that all participants in the present study were enrolled in college. It is possible that individuals who experienced severe trauma early in life were not represented in our sample due to impairment related to their experiences. Some research suggests that adverse childhood experiences are associated with high school dropout (Moore & Stoddard, 2025) and with barriers to success in college (Hinojosa et al., 2019).

Overall, the present findings suggest that developmental timing alone may not be sufficient to predict PTSD severity without considering trauma type, frequency, and context.This supports the idea in the literature that the nature of the event may be more important than when it happened. Additional research will help to shed light on the importance of developmental timing of trauma.

Several limitations should be considered when interpreting the findings of this study. First, this study used a cross-sectional design, meaning that all data were collected at one point in time. As a result, we cannot make strong conclusions about cause and effect or about how PTSD symptoms develop over time. For example, we cannot determine whether trauma characteristics caused differences in PTSD severity or whether current PTSD symptoms influenced how participants remembered and reported their trauma experiences.

Second, the study relied on retrospective self-reports. Participants were asked to recall their worst traumatic event and the age at which it occurred. This approach may introduce recall bias, as individuals may have difficulty remembering the exact timing, details, or severity of past events. Although we had no direct measure of recall accuracy, memory errors could have affected our results.

Third, there were unequal group sizes and structurally empty cells across trauma types and developmental periods. Some trauma categories were rare or occurred mainly at specific ages. In particular, child maltreatment was, by definition, only reported in the childhood group. These issues may also have reduced statistical power for some comparisons.

Fourth, there was limited variability in trauma frequency. As a result, we could not fully examine the impact of cumulative trauma exposure. Previous research suggests that repeated and multiple traumas, especially interpersonal ones, are strongly related to PTSD severity. Not accounting for cumulative exposure may have reduced our ability to detect timing effects.

Fifth, we excluded participants who reported combat or war-zone exposure (n = 3) to maintain a focus on civilian trauma. This decision was appropriate given our undergraduate sample and the very small number of participants who reported combat exposure. However, this choice also limits the generalizability of our findings. Previous research shows that combat trauma is strongly associated with high PTSD prevalence and severity (Kessler et al., 2017; May & Wisco, 2016). Therefore, excluding these cases may have influenced the overall symptom distribution and group comparisons in the present study. At the same time, some civilian studies, such as the sample examined by Kelley and colleagues (2009), also did not include combat exposure. For this reason, the findings of the current study should be interpreted specifically within the context of civilian trauma, and caution should be used when applying these results to military or veteran populations. Future research should examine whether the patterns observed in this study, particularly the higher PTSD severity associated with interpersonal trauma compared to non-interpersonal trauma, also appear in samples that include combat-related trauma.

Finally, several important factors were not measured in this study. We did not assess contextual details such as the duration of the trauma, the closeness of the relationship to the perpetrator, or the level of perceived betrayal. We also did not assess co-occurring mental health conditions, which may influence PTSD severity but were outside the scope of the current analysis.

Future research should build on the current findings in several important ways. First, future studies should aim to recruit larger samples with clinical assessment across trauma types and developmental periods. Larger and more evenly distributed samples would allow the use of more advanced statistical models, such as regression or interaction analyses, to better test how trauma type and developmental timing jointly predict PTSD severity. Although a continuous age-at-trauma variable could be used, regression assumes a linear relationship between age at exposure and PTSD severity. In our data, this assumption does not appear to hold, as the adolescent group showed lower PTSD severity than both childhood and adulthood, suggesting a non-linear pattern. Future studies with larger samples could test linear models or use finer-grained age categories to more accurately capture developmental effects.

In the present study, some trauma categories were rare or only occurred in certain age groups, which limited our ability to test interactions. For example, child maltreatment was reported only in childhood, making it impossible to examine its effects across later developmental periods. Recruiting more adults whose worst trauma was child maltreatment would allow researchers to directly test interactions between trauma type and timing, including the hypothesis that early interpersonal trauma has especially strong effects.

Second, longitudinal designs are strongly recommended. Studies that follow individuals over time after trauma exposure would help clarify how PTSD symptoms emerge, change, and persist. Longitudinal research could also better examine whether early-life trauma leads to different symptom trajectories than trauma experienced in adolescence or adulthood. In addition, prospective designs would reduce reliance on retrospective recall and help minimize memory bias. Finally, future research should use more detailed trauma assessments, especially those assessing trauma frequency. Rather than focusing only on the worst trauma, studies should assess important contextual features such as whether the trauma was single or repeated, the identity of the perpetrator (e.g., family member vs. stranger), the severity of the event, and its immediate consequences. These factors may help explain why some traumas are more psychologically damaging than oth- ers.

In conclusion, this study highlights the importance of trauma characteristics, especially the distinction between interpersonal and non-interpersonal events, in predicting PTSD symptom severity. We found that traumas involving another person (Interpersonal Violence or Child Maltreatment) or sudden loss were associated with higher PTSD symptoms, whereas Non-Interpersonal Traumas like accidents yielded lower symptoms. The timing of trauma alone had little effect on symptoms in our sample, suggesting that the nature of the trauma may be more important than the age at which it occurred in predicting PTSD symptom severity. These findings underscore that clinicians and researchers should pay close attention to the nature of a person's trauma exposure when assessing PTSD risk and planning interventions. Our results align with prior work emphasizing the outsized impact of interpersonal trauma on PTSD. In sum, future trauma research and care should consider trauma type and context, not just age of occurrence, to better understand and treat PTSD.

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Audrey N Alberson

Preliminary mechanical characterization of poly(D,L-lactic acid), polydioxanone, and type I collagen electrospun scaffolds

Faculty Sponsor

Dr. Gary L. Bowlin

Abstract

Impaired wound healing continues to be a significant clinical challenge, with contributing conditions such as diabetes, cardiovascular disease, and obesity increasing in prevalence. Electrospinning, a technique for fabricating fibrous biomaterials, shows promise for improving wound healing as well as serving as a platform for drug-delivery applications. Poly(D,L-lactic acid) (PDLLA) is a polymer extensively researched as microspheres in injectable dermal fillers, but there is limited research on PDLLA in other configurations, such as electrospinning. This study aimed to quantify the tensile mechanical properties of electrospun scaffolds fabricated with varying concentrations of PDLLA, polydioxanone, and type I collagen, evaluating the ultimate tensile strength (UTS) and Young's modulus relative to experimental values for native skin tissue. Results demonstrated that while the UTS of each sample did not reach the reference values for skin, the blend consisting of PDLLA, polydioxanone, and collagen exhibited a Young's modulus closest to the reference values. The addition of PDLLA to electrospun scaffolds demonstrates an increase in elasticity while decreasing UTS, giving further insight into potential future applications for this polymer. With PDLLA's applications in drug delivery, the incorporation of PDLLA in electrospun scaffolds increases possible clinical uses for improving outcomes in impaired wound healing cases.

Introduction

Wound healing is an essential process that occurs in response to tissue injury, involving complex interactions between multiple bodily systems. Injuries to bodily tissues occur regularly so the processes within healing these injuries must remain functional, as disruptions can lead to infection or further injury [1]. Impaired wound healing is becoming increasingly common, with contributing factors not limited to obesity, diabetes, stress, and cardiovascular disease [2]. Understanding the mechanisms of wound healing, as well as how disease disrupts essential cellular functions, ultimately leads to innovative approaches to addressing clinical challenges arising from tissue injury.

One solution for healing wounds uses a scaffold that first anchors cells, thus allowing them to reconstruct a native body extracellular matrix, all without stimulating a response from the immune system [3]. One biomaterial fabrication technique, electrospinning, was selected because its fiber size and orientation mimic the structure of the extracellular matrix [3], one of the primary locations where wound healing occurs. This technique involves placing a syringe of polymer solution on a pump and charging the solution via a voltage source, so that the resulting solution forms a liquid jet out of the needle tip. The jet then creates polymer fibers as the solvent evaporates, and the fibers deposit on a collector to form a non-woven mat [4]. In addition to biocompatible polymer, an active pharmaceutical ingredient (API) may be incorporated into an electrospun scaffold to treat specific diseases or improve clinical outcomes. There are several methods to integrate pharmaceuticals, including but not limited to postspinning modification, blending the API with the electrospun solution, and coaxial electrospinning with a blended core and a polymer shell [5].

Poly(D,L-lactic acid), commonly referred to as PDLLA, is a biodegradable polymer studied in dermatology as an injectable dermal filler. Specifically, PDLLA promotes collagen synthesis and tissue regeneration, two ideal characteristics for a dermatological biomaterial. There are several well-researched applications for PDLLA currently under study or marketed, ranging from treatments for facial wrinkles to cancer drug delivery. One preliminary study focused on the marketed formulation Juvelook (VAIM Inc., Republic of Korea) which uses injected PDLLA in addition to non-cross-linked hyaluronic acid, and found that this combination increased skin elasticity, firmness, and hydration. Other studies have focused on specific skin concerns, such as treatments involving injected Juvelook to improve the appearance of stretch marks. Multiple studies with high patient satisfaction rates, in addition to limited adverse reactions, marks potential in a promising treatment for common skin concerns [6]. One study by Wang et al. indicates that loading the cancer drug rapamycin onto a PEO/PDLLA nanofiber mesh shows promise as a targeted drug delivery system for glioma and other malignant cancers [7].

Since PDLLA and PDLLA blends demonstrate potential across different cell types, including the skin as well as the supportive glial cells affected by glioma [8], there is a broad array of possible clinical applications across medical specialties. Research on PDLLA has primarily focused on spherical microparticles, and studies have yet to thoroughly examine its properties in other configurations, such as nanofibers formed by electrospinning. Biocompatibility, along with slow and controlled degradation, solidifies PDLLA as an excellent candidate in tissue engi- neering and regenerative medicine [6].

Polydioxanone (PDO) is a polymer extensively studied for its biodegradability and compatibility within the human immune system, especially within the context of PDO as a biodegradable monofilament suture. Despite commercial use limiting PDO usage to sutures, this polymer exhibits beneficial mechanical properties as an electrospun scaffold. Shape memory properties displayed by PDO sutures are observed in electrospun mats as well, indicating possible future use in tissue engineering applications [9]. Type I collagen is a common structural protein within the body, primarily found in interstitial extracellular matrix. Due to its role in structural tissue support, collagen exhibits rigidity, resistance to stretching [10], and biocompatibility, making it a model for ideal electrospun material characteristics that mimic the extracellular matrix. These mechanical characteristics are due to collagen's fibril-forming structure, where fibril diameters and organized arrangements vary across bodily tissues depending on the system's need for structural support [11]. PDO and collagen have established prominence in tissue engineering due to their ideal wound healing characteristics, thus a PDO and type I collagen blend serves as the control group for this study.

Evaluating biomaterials for medical applications involves a wide range of tests, including mechanical testing. Assessing the mechanical properties of a biomaterial suggests potential medical applications, especially when compared to materials already found within the body. In general, mechanical evaluation for electrospun materials occurs under tension, where the values for material stress and strain provide the material's ultimate tensile strength, percent elongation, and Young's modulus. Ultimate tensile strength is the maximum amount of force that a material can withstand before breaking, and percent elongation is the amount of material deformation in relation to its original size. Young's modulus is a calculation that shows the material's stiffness, where a high Young's modulus suggests significant material deformation and thus high elasticity. These three significant pieces of information provide a solid foundation for understanding a specific biomaterial and its medical relevance when comparing to native tissues. This study aims to quantify the mechanical properties of PDLLA and PDLLA-containing electrospun blends, comparing them to a PDO and collagen control group.

Materials & Methods

Solutions consisting of collagen (type I collagen isolated from rat tails), polydioxanone (PDO, DIOXOMAXX®100, inherent viscosity 1.7 dL/g, Bezwada Biomedical, Hillsborough, NJ, USA), and poly(D, L-lactic acid) (PDLLA, inherent viscosity 1.62 dL/g, Bezwada Biomedical, Hillsborough, NJ, USA) in various concentrations were added to 4 mL of 1,1,1,3,3,3-hexafluoro-2-propanol (HFP, Thermo Fisher Scientific Inc., Waltham, MA, USA) and allowed to dissolve overnight. Four solutions were created, with specifications listed in Table 1.

PDLLA	400 mg PDLLA, 4 mL HFP
PDLLA, collagen blend	400 mg PDLLA, 40 mg collagen, 4 mL HFP
PDO, collagen blend	400 mg PDO, 40 mg collagen, 4 mL HFP
PDO, PDLLA, collagen blend	200 mg PDO, 200 mg PDLLA, 40 mg collagen, 4 mL HFP

Table 1.

Initial solutions with specific quantities involving PDLLA, PDO, collagen, and HFP.

Once dissolved, solutions were transferred to 5 mL Luer-Lok™ syringes (Becton, Dickson and Company, Franklin Lakes, NJ, USA) equipped with an 18-gauge, 2-inch blunt needle (McMaster-Carr, Elmhurst, IL, USA). The syringe was placed onto a KDS Legacy 100 Syringe Pump (KD Scientific,nHolliston. MA, USA) set at varying flow rates from 1.2 mL/h to 2.0 mL/h, as well as varying voltages from 20 kV to 28 kV, adjusting to ensure proper fiber deposition. One sample of each solution composition was collected via the traditional electrospinning technique. Five samples of a 20 mm gauge length dog-bone shape were cut from each sample for tensile testing.

Samples were fixed on a uniaxial testing frame (Model Q CONTROLLER, Test Resources, Shakopee, MN, USA) and evaluated under tensile stress. Grips were separated at 10mm/min until failure, and data were recorded in Newtons (N) at 50 samples per second. Material stress was recorded alongside the vise grips' displacement. The ultimate tensile strength (UTS) in megapascals (MPa) was calculated by the frame controller using the input initial cross-sectional area. Percent elongation and Young's modulus were then computed using a MATLAB script. Data is reported as both raw values and mean ± standard deviation.

The raw values were then analyzed statistically using GraphPad Prism. Calculations produced from the MATLAB script were analyzed for normality before any further statistical testing. Normality testing demonstrated the normal distribution of the UTS and Young's modulus data, indicating the use of a BrownForsythe and Welch ANOVA. However, testing showed that percentage elongation data groups were not normally distributed, so a Kruskal-Wallis test was used instead. Groups were compared for statistical significance against the PDO and collagen control.

Results

The raw mechanical testing data in megapascals (MPa) for ultimate tensile strength (UTS) is shown in Table 2. The mean values in decreasing order are the PDO/ collagen blend with 6.51 ± 0.55 MPa, the PDLLA/PDO/collagen blend with 6.17 ± 0.31 MPa, the PDLLA/collagen blend with 5.48 ± 0.82 MPa, and lastly the PDLLA solution with 4.11 ± 0.13 MPa. The PDLLA solution was the only group significantly weaker than the control with a p-value less than 0.01. The ultimate tensile strengths of the four groups in a box-and-whisker plot format are shown in Figure 1. Statistical analysis was performed using a Brown- Forsythe and Welch ANOVA.

PDO/Collagen	PDLLA	PDLLA/Collagen	PDLLA/PDO/Collagen
6.72	4.09	6.51	5.98
5.68	4.21	4.23	6.61
7.01	3.89	5.41	6.17
6.91	4.21	5.53	6.30
6.22	4.15	5.73	5.81

Table 2.

Ultimate tensile strength raw data (MPa).

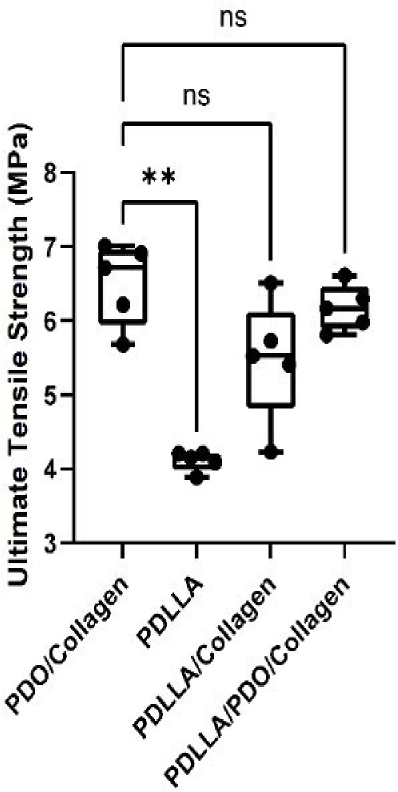

Figure 1.

*Box-and-whisker plot of ultimate tensile strength (MPa) for PDO/collagen, PDLLA, PDLLA/collagen, and PDO/PDLLA/collagen electrospun scaffolds. Asterisks indicate statistically significant differences (** denotes $p < 0.01$).*

Mechanical testing data for elongation are displayed in Table 3 as percentages. The mean values in decreasing order are the PDLLA solution at 820.7 ± 36.44%, the PDO/collagen blend at 202.28 ± 33.27%, the PDLLA/collagen blend at 177.17 ± 38.39%, and the PDLLA/PDO/collagen blend at 140.20 ± 13.73%. None of the tested groups were significantly different than the control. The percentage elongation of each group is shown in a box-and-whisker format in Figure 2.

PDO/Collagen	PDLLA	PDLLA/Collagen	PDLLA/PDO/Collagen
242.10	808.77	245.03	136.00
158.12	800.77	154.65	150.65
197.28	885.55	158.82	152.90
186.67	800.77	157.25	142.72
227.25	807.68	170.10	118.75

Table 3.

Percent elongation at break (%)

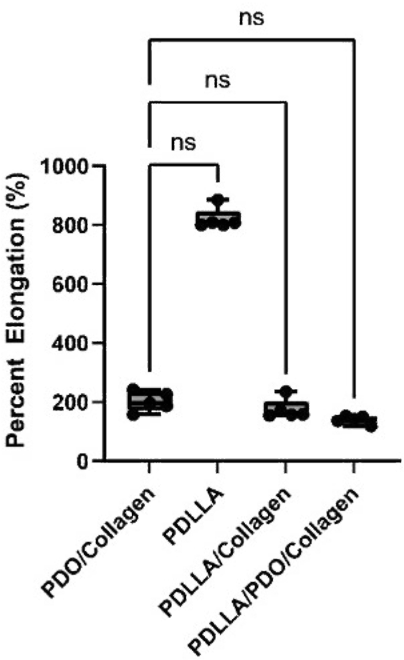

Figure 2.

Box-and-whisker plot of elongation as a percentage for PDO/collagen, PDLLA, PDLLA/collagen, and PDO/PDLLA/collagen electrospun scaffolds.

Young's modulus in megapascals for each group are shown in Table 4, and a box-and-whisker plot is shown in Figure 3. The mean values in decreasing order are the PDLLA/PDO/collagen blend at 77.39 ± 11.72 MPa, the PDLLA solution at 49.13 ± 11.97 MPa, the PDLLA/collagen blend at 40.98 ± 27.97 MPa, and the PDO/collagen blend at 30.97 ± 8.26 MPa.

PDO/Collagen	PDLLA	PDLLA/Collagen	PDLLA/PDO/Collagen
34.05	64.16	5.28	68.43
21.50	42.50	23.88	83.45
40.18	32.67	76.78	79.16
23.05	53.51	57.76	63.32
36.08	52.81	41.19	92.59

Table 4.

Young's modulus data (MPa).

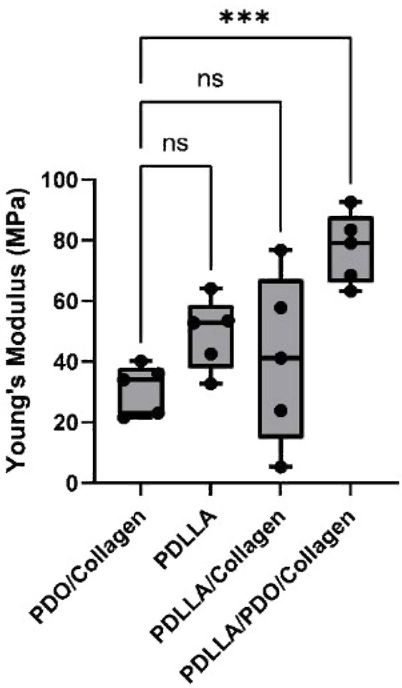

Figure 3.

*Box-and-whisker plot of Young's modulus (MPa) for PDO/collagen, PDLLA, PDLLA/collagen, and PDO/PDLLA/collagen scaffolds. Asterisks indicate statistically significant differences (*** denotes p < 0.001).*

Discussion

Grafts consisting solely of PDLLA scaffolds exhibited high elongation at break but low ultimate tensile strength. This suggests that PDLLA scaffolds can be applied to systems where tissues do not experience much mechanical load but still need the ability to stretch with movement. With the addition of type I collagen to PDLLA, tensile strength increased while elongation at break decreased. The blend consisting of PDLLA, collagen, and PDO resulted in the highest elasticity shown by the Young's modulus as well as a UTS similar to the control PDO and collagen blend, but it exhibited the least amount of elongation. This study suggests an inverse relationship between elasticity and tensile strength when collagen and PDO are added to PDLLA.

The Young's modulus of the PDO, PDLLA, and collagen blend exhibits the most similarity to native skin tissue reported by Annaidh et al. [12]. The blend in this study exhibited a Young's modulus of 77.39 ± 11.72 MPa, compared to the average 83.3 ± 34.9 MPa reported by Annaidh et al. However, the PDO, PDLLA, and collagen blend exhibited a UTS of 6.17 ± 0.31 MPa, contrasting the reference UTS of native skin tissue at 21.6 ± 8.4 MPa. Because of the significant difference in Young's modulus between the PDO/collagen and the PDLLA/PDO/collagen samples, this study suggests that the addition of PDLLA increases elasticity in electrospun scaffolds.

PDLLA-containing scaffolds exhibit distinct mechanical characteristics relative to other electrospun polymer nanofibers, such as polycaprolactone (PCL) and polyglycolic acid (PGA). Relative to the results obtained by Aghdam et al., the average UTS of the PDLLA/collagen and PDLLA/PDO/collagen blends show greatest similarity to the PCL/PGA blend at a 50/50 weight ratio [13]. The PDLLA-containing blends exhibited greater elongation and Young's modulus than the blends studied containing PCL and/or PGA. Incorporating PDLLA into blends containing PCL and PGA may increase elasticity if desired for specific clinical use.

One limitation in this study is the variability in conditions across electrospun samples. Differences in ambient conditions, specifically humidity, necessitated adjustments to voltage and flow rate that may account for variability across samples. Future studies will benefit from the uniformity of fabrication parameters. Further research is needed in other aspects of these polymers to understand their full potential within tissue engineering. Future work to analyze pore sizes and nanofiber structures may clarify the reasoning behind these mechanical observations as well as inform the direction of biocompatibility testing.

Wound healing assays or studies on fibroblast infiltration and migration would be beneficial, as well as various assays that quantify the immune response to these specific biomaterial blend ratios, adding more information for optimal cell compatibility of a PDLLA electrospun material. Additionally, electrospun materials incorporating PDLLA could serve as a route for drug-delivery applications. Previous studies have analyzed electrospun polymers incorporating drugs, including-steroidal anti-inflammatory drugs (NSAIDs) and antibiotics [3]. Given mechanical differences between PDLLA and previously investigated polymers, PDLLA warrants further investigation to determine its potential in drug-delivery systems.

Conclusion

This study aimed to mechanically characterize four polymer solutions as traditionally electrospun scaffolds, with results to suggest future studies based on similarities to native tissues in the human body. The different polymer blends exhibited distinct mechanical characteristics under tensile stress. Seen with the addition of type I collagen to blends of PDLLA and PDO, these findings suggest an inverse relationship between elasticity and material strength. Ratios in these blends present trade-offs, so the mechanical properties required must be considered when selecting a polymer or blend for biomedical applications.

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Too many em dashes? Weird words like ‘delves’? Spotting text written by ChatGPT is still more art than science

Faculty Contributor
Dr. Roger J. Kreuz

People are now routinely using chatbots to write computer code, summarize articles and books, or solicit advice. But these chatbots are also employed to quickly generate text from scratch, with some users passing off the words as their own. This has, not surprisingly, created headaches for teachers tasked with evaluating their students' written work. It's also created issues for people seeking advice on forums like Reddit, or consulting product reviews before making a purchase. Over the past few years, researchers have been exploring whether it's even possible to distinguish human writing from artificial intelligence-generated text. But the best strategies to distinguish between the two may come from the chatbots themselves.

Too good to be human?

Several recent studies have highlighted just how difficult it is to determine whether text was generated by a human or a chatbot. Research participants recruited for a 2021 online study, for example, were unable to distinguish between human- and ChatGPT-generated stories, news articles and recipes. Language experts fare no better. In a 2023 study, editorial board members for top linguistics journals were unable to determine which article abstracts had been written by humans and which were generated by ChatGPT. And a 2024 study found that 94% of undergraduate exams written by ChatGPT went undetected by graders at a British university.

Clearly, humans aren't very good at this.

A commonly held belief is that rare or unusual words can serve as "tells" regarding authorship, just as a poker player might somehow give away that they hold a winning hand. Researchers have, in fact, documented a dramatic increase in relatively uncommon words, such as "delves" or "crucial," in articles published in scientific journals over the past couple of years. This suggests that unusual terms could serve as tells that generative AI has been used. It also implies that some researchers are actively using bots to write or edit parts of their submissions to academic journals. Whether this practice reflects wrongdoing is up for debate.

In another study, researchers asked people about characteristics they associate with chatbot-generated text. Many participants pointed to the excessive use of em dashes – an elongated dash used to set off text or serve as a break in thought – as one marker of computer-generated output. But even in this study, the participants' rate of AI detection was only marginally better than chance.

Given such poor performance, why do so many people believe that em dashes are a clear tell for chatbots? Perhaps it's because this form of punctuation is primarily employed by experienced writers. In other words, people may believe that writing that is "too good" must be artificially generated. But if people can't intuitively tell the difference, perhaps there are other methods for determining human versus artificial authorship.

Stylometry to the rescue?

Some answers may be found in the field of stylometry, in which researchers employ statistical methods to detect variations in the writing styles of authors. I'm a cognitive scientist who authored a book on the history of stylometric techniques. In it, I document how researchers developed methods to establish authorship in contested cases, or to determine who may have written anonymous texts. One tool for determining authorship was proposed by the Australian scholar John Burrows. He developed Burrows' Delta, a computerized technique that examines the relative frequency of common words, as opposed to rare ones, that appear in different texts. It may seem counterintuitive to think that someone's use of words like "the," "and" or "to" can determine authorship, but the technique has been impressively effec- tive.

Burrows' Delta, for example, was used to establish that Ruth Plumly Thompson, L. Frank Baum's successor, was the author of a disputed book in the "Wizard of Oz" series. It was also used to determine that love letters attributed to Confederate Gen. George Pickett were actually the inventions of his widow, LaSalle Corbell Pickett. A major drawback of Burrows' Delta and similar techniques is that they require a fairly large amount of text to reliably distinguish between authors. A 2016 study found that at least 1,000 words from each author may be required. A relatively short student essay, therefore, wouldn't provide enough input for a statistical technique to work its attribution magic.

More recent work has made use of what are known as BERT language models, which are trained on large amounts of human- and chatbot-generated text. The models learn the patterns that are common in each type of writing, and they can be much more discriminating than people: The best ones are between 80% and 98% accurate.

A stylometric technique called Burrow's Delta was used to identify LaSalle Corbell Pickett as the author of love letters attributed to her deceased husband, Confederate Gen. George Pickett. Encyclopedia Virginia.

However, these machine-learning models are "black boxes" – that is, we don't really know which features of texts are responsible for their impressive abilities. Researchers are actively trying to find ways to make sense of them, but for now, it isn't clear whether the models are detecting specific, reliable signals that humans can look for on their own.

A moving target

Another challenge for identifying bot-generated text is that the models themselves are constantly changing – sometimes in major ways. Early in 2025, for example, users began to express concerns that ChatGPT had become overly obsequious, with mundane queries deemed "amazing" or "fantastic." OpenAI addressed the issue by rolling back some changes it had made. Of course, the writing style of a human author may change over time as well, but it typically does so more gradually. At some point, I wondered what the bots had to say for themselves. I asked ChatGPT-4o: "How can I tell if some prose was generated by ChatGPT? Does it have any 'tells,' such as characteristic word choice or punctuation?" The bot admitted that distinguishing human from nonhuman prose "can be tricky." Nevertheless, it did provide me with a 10-item list, replete with examples.

These included the use of hedges – words like "often" and "generally" – as well as redundancy, an overreliance on lists and a "polished, neutral tone." It did mention "predictable vocabulary," which included certain adjectives such as "significant" and "notable," along with academic terms like "implication" and "complexity." However, though it noted that these features of chatbot-generated text are common, it concluded that "none are definitive on their own."

Chatbots are known to hallucinate, or make factual errors. But when it comes to talking about themselves, they appear to be surprisingly perceptive.

From Plausibility to Practice: Generative AI and the Changing Research Environment

Faculty Contributor
Dr. J. Elliott Casal

Three years ago, “generative AI” meant ChatGPT: a surprising, sometimes impressive, often wrong, meticulously hyped, and generally concerning technology. Many also saw tremendous promise. Three years later, this all still largely applies, although we have a broader set of so-called ‘GenAI’ tools and are somewhat less surprised by new affordances as they roll out to the public. As I see it, the real impact of GenAI on research and teaching within my field (and beyond) is not merely that machines can produce language, but that they are reshaping the conditions under which language, expertise, and knowledge circulate.

First impressions

The first thing I ever did with ChatGPT back in late 2022 was ask it to write a poem about itself in the style of Emily Dickinson. The second was to ask it to give me home-care advice for hallux rigidus while recreating the persona of Mike Tyson from the cartoon Mike Tyson Mysteries (everyone else was trying pirates). Both tests were strange, uneven, and compelling.

Focusing on my first example, my early impression was that because responses were instantaneous and had continuity, there was a sort of interactive persistence between prompts. Context accumulated through refinement in a way that was distinct from the trial-and-error logic of traditional coding. I had to teach and model slant rhyme, I had to define and model Dickinson’s unique wit, I had to work on a core metaphor for the poem, but we landed on the verb trace to describe what GenAI does. The resulting poem was surprisingly good for an early public version of ChatGPT, and I felt an eerie sense of ownership and involvement. The first stanza reads:

Upon the Web I met a Mind — A
Wit without a Face —
I asked if it knew Humankind,
“It’s you,” it said, “I trace.”

When I was first asked to speak on ChatGPT at our university, my charge was to address faculty and student thoughts and concerns about the new technology. In preparation, I asked faculty across campus about GenAI, and there was a clear focus on immediate institutional disruption via plagiarism and academic dishonesty. Undoubtedly, this remains a primary issue in higher education. When I asked undergraduate students about their views, a consistent existential feeling of uncertainty emerged: What could students dedicate themselves to ‘now’ that would still be valued in four years?

At the time, conversations about what this technology meant for research (and research ethics) in my field (and in general) were limited, and so, on the last day of AAAL 2023 my colleague Matt Kessler (University of South Florida) and I sought to jumpstart such discussions. Using a long-form prompting protocol, we investigated the extent to which 72 editorial board members from top Applied Linguistics journals could distinguish AI-generated research article abstracts from human-written ones and what criteria formed the basis of their decisions. To the surprise of many, the findings of our paper (Casal & Kessler, 2023) suggest that despite employing multiple rationales to judge texts, reviewers were largely unsuccessful in identifying AI versus human writing in this context, with an overall positive identification rate of only 38.9% even at that time. The key was that we fed entire research papers into the system, rather than providing a generic prompt to 'write an abstract for a research paper on X topic'. Like my Emily Dickinson poem experiment, this highlighted not simply that ChatGPT was already capable of producing lucid text, but that users could collaboratively shape genre-appropriate discourse through iterative input and refinement, and they could do so with remarkable speed.

Suddenly, everything has changed

Early questions were often framed around plausibility: *could ChatGPT/GenAI make texts that were 'good enough?* ' However, a short time later we are in a radically changed linguistic ecology. Doubts of plausibility have given way to rapidly evolving practices with surprisingly little policy. In "Taking the reins as researchers and steering its use toward ethical outcomes" (Kessler & Casal, 2024), my co-author and I argue that researchers must take an active role in shaping how these technologies are used rather than treating them as inevitable or external to academic practice. As they emerge, policies tend to be frameworks for permissiveness rather than tools for making principled practical decisions. Admittedly, this applies to my own work contributing to GenAI policies as well; the landscape is changing quickly, and there is widespread disagreement.

Clearly, AI-generated language is no longer marginal or experimental. Recent reports claim that substantial portions of online text (at least 30% of text on active websites), and particularly new online content (up to 75%), is now produced or assisted by generative AI tools (Law et al., 2025; Spennemann, 2025). Researchers across scientific disciplines increasingly report using these systems in the preparation of scholarly writing as well (Liang et al., 2025). The ethics surrounding these trends are murky and context-specific, and some communities are overrun with 'slop' too.

Within linguistics, modern usage-based approaches highlight that language users are sensitive to the distributional patterns of linguistic resources in their environments (e.g., Ellis et al., 2014; Ellis & Ferreiria-Junior, 2009). In other words, people learn language from the language they are exposed to, building linguistic knowledge as they pay attention over their lifetimes to the ways that different meanings are expressed in context. Language produced by generative AI tools is now a prominent part of the linguistic ecology, as it increasingly appears in search results, institutional communications, student writing, public and online discourse, entertainment and media content, and even scholarly publication itself. As the presence of AI-generated language in these (and other) environments become normalized, significant questions are raised about how these systems may recursively shape future language use, genre expectations, and communicative norms.

To me, there is plenty of room for compelling research on these issues. Do we attend to and learn from linguistic input differently if we are aware a language source is AI generated? How strongly are community conventions reshaped by changes in patterns of AI language across models? What are the implications of students reading AI-generated summaries rather than primary sources on their literacy skills and depth of cultural knowledge? Does the flattening of lexical, phrasal, syntactic, and rhetorical conventions in AI-generated or assisted text push us to prize creativity further?

Let's say the human part out loud

Instead, much discussion in research, educational, and technology worlds focuses on 'AI capability,' as though outputs emerge independently of interaction. Discussions of AI in linguistics often focus on whether systems possess linguistic competence, what features they do or do not make use of 'like humans', or how effectively they contribute to language teaching and learning. To some degree and depending on one's theoretical perspective, aspects of these questions may indeed be valuable.

However, AI outcomes are often treated as properties of the models themselves rather than emergent properties of human-model interaction, including iterative refinement practices, user expertise and disposition, and discourse contexts. In many cases, the early discussions of 'the human in the loop' have already faded into set-it-and-forget-it approaches for prompt engineering that reinforce a static view of AI potential, rather than an extended cognition model of human computer interaction.

My own experiences with ChatGPT and other tools, including collaboratively refining an Emily Dickinson poem line-by-line, suggest something quite different. The most compelling outputs often emerge not from well-conceived isolated prompts, but from sustained interactions that leverage my own creativity, evolving goals, capacity for learning, knowledge and expertise, and playful disposition. AI-generated language is now abundant in our usage environments, but the best AI outcomes emerge through recursive interaction empowered by the things that make humans good at what they do.

The students were right about the uncertainty, and today the question is clearly no longer whether generative AI can produce plausible discourse. It is how research, teaching, and language itself change once plausible discourse becomes abundant and cumulatively embedded within the environments from which future discourse practices emerge.

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