UNIVERSITY of MONTEVALLO

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WELCOME

"WHETHER OR NOT YOU REACH YOUR GOALS IN LIFE DEPENDS ENTIRELY ON HOW WELL YOU PREPARE FOR THEM AND HOW BADLY YOU WANT THEM. "

RONALD E. MCNAIR, PH.D

In an era where knowledge is rapidly evolving, this journal serves as a testament to the creativity and intellectual rigor of emerging scholars. It offers a space for students to share their innovative ideas, diverse perspectives, and unique contributions across various disciplines.

Whether exploring the frontiers of science, delving into the complexities of humanities, or addressing pressing social issues, each article published here reflects the passion and dedication of its authors.
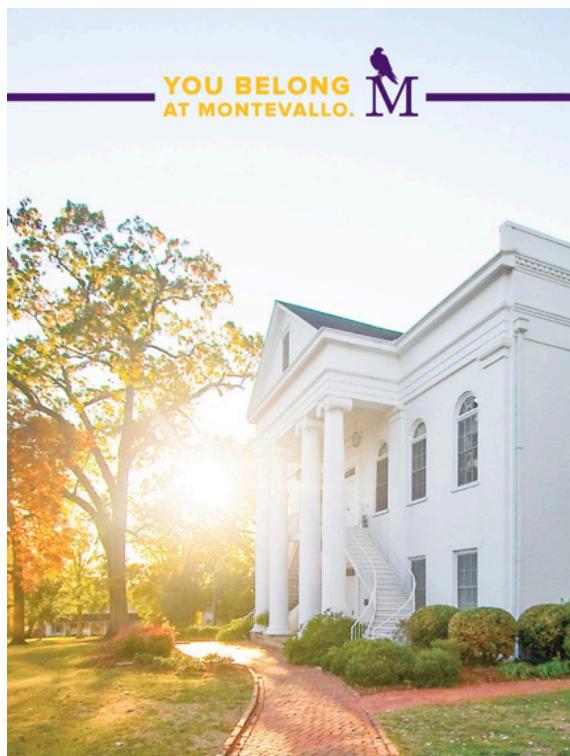
This journal represents a culmination of diligent inquiry, critical thinking, and academic curiosity, embodying the spirit of exploration that defines the journey of learning. Through the peer-reviewed process, our aim is not only to highlight exceptional student research but also to foster a community of learning and collaboration. By engaging with the articles in this journal, readers are invited to join us in celebrating the achievements of young scholars and in exploring the exciting possibilities that lie ahead.

We hope you find this journal both enriching and inspiring as you embark on a journey through the scholarly endeavors of today's students.

Warm regards,

**Jamaica S. Dunigan, M. Ed
Director, TRIO McNair Scholars Program**

History of the University of Montevallo

Due to the efforts of Julia Tutwiler who advocated for the technical training of girls, the University of Montevallo opened in October 1896 as the Alabama Girls' Industrial School (AGIS), a women-only technical school that also offered high school-level courses. AGIS became the Alabama Girls' Technical Institute in 1911, further adding "and College for Women" in 1919. The school gradually phased into being a traditional degree-granting institution, becoming Alabama College, State College for Women in 1923.

The school's supporters lobbied the Alabama Legislature, which passed a bill on January 15, 1956 that dropped the designation "State College for Women", effectively making the school coeducational. The first men entered the school that same month. In 1965, the board of trustees authorized President D. P. Culp to sign the Certificates of Assurance of Compliance with the Civil Rights Act of 1964. In the fall of 1968, three African American women, Carolyn Buprop, Ruby Kennbrew, and Dorothy (Lilly) Turner, enrolled in the university. On September 1, 1969, Alabama College was renamed the University of Montevallo. Today, the University of Montevallo is the only public liberal arts college in Alabama and is a member of the prestigious Council of Public Liberal Arts Colleges (COPLAC).

Montevallo is located in the geographic center of the state of Alabama in an area rich with Civil War history. With slightly over 3,000 students, the university generates a significant economic impact on the surrounding communities in Shelby County. Many of the buildings on campus predate the founding of the college, including King House and Reynolds Hall. The King House is reserved for special guests of the campus, and Reynolds Hall is still used by the Theater Department and alumni relations. King House was reportedly the first home in Alabama to receive pane glass windows. Montevallo's campus is considered an architectural jewel. Its appearance is more in line with private, elite institutions. The central part of campus is a National Historic District, listed on the National Register of Historic Places. The Olmsted Brothers' firm, who also designed the grounds for the Biltmore House in North Carolina, designed the main portion of the campus. Frederick Law Olmsted designed Central Park in New York.

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About Page

About TRIO

The Federal TRIO Programs were established by Congress to provide educational assistance and opportunities for all Americans regardless of ethnic/racial backgrounds or economic status. TRIO encompassing Talent Search, Upward Bound, Student Support Services, Educational Opportunities Program, and the Ronald E. McNair postbaccalaureate Achievements programs reflect our country's commitment to diversity and equality in education. These programs, funded by the title IV Higher Education Act of 965, generally serve first generation low-income students, students with disabilities and students from groups underrepresented in higher education.

About Ronald E. McNair

Ronald Erwin McNair was born October 21, 1950 in Lake City, South Carolina. McNair's thirst for scientific knowledge led him to a Bachelor of Science degree in Physics from North Carolina A&T State University, graduating magna cum laude. Earning a Ph.D. in Physics from Massachusetts Institute of Technology in 1976, he became a widely recognized expert in laser physics while working with the Hughes Research Laboratory. Further distinguishing his career, he was chosen from a pool of ten thousand applicants for the NASA Space Shuttle Program. In 1986, Dr. McNair was a mission specialist aboard his second Challenger flight when the shuttle was tragically lost in an accident that claimed the lives of the entire crew. To honor the memory of Dr. McNair, Congress allocated funding for the Ronald E. McNair Postbaccalaureate Achievement Program.

McNair Scholars Program

The University of Montevallo is committed to the legacy and memory of Dr. Ronald E. McNair. Our scholars, representing a diverse background, look forward to continuing their educational endeavors in graduate and doctoral programs. The program facilitates educational and academic growth through research opportunities, faculty mentoring relationships, and related services. The scholars attend and present their research at national conferences and network with professionals in their fields of study.

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A Review of Alternative Education

Miguel Angel Arreola Gomez

Abstract

Alternative Education is a steadily growing sector in public education as comprehensive schools are unable to meet the needs and demands of students who fall behind or experience some form of hardship in their education. This study will gather existing data from multiple sources to identify programs and institutions that can be defined as Alternative Education, explore the demographics and areas of these programs, and examine factors that have contributed to their placement in Alternative Education. This study reviewed scholarly articles and government reports to gather information. The investigation can address the meaning, need, and students that make up Alternative Education institutions where other investigations hyper-focused on specific case programs. The study identifies a lack of standard implementation and instructional dynamics among independent programs. Despite these differences, a common goal is to help students graduate "on time," discipline those with behavioral issues, or support their return to their home schools. The study highlights recurring themes that contribute to student placement in Alternative Education. Furthermore, these findings will support future research concerning the efficacy and impact of Alternative Education from a long-range perspective.

Keywords: Alternative Education, Progressive Education, Credit Recovery, GED, Adult Education, Continuation School

Alternative Education represents a critical component of the modern educational system, yet it remains an area in which definitions vary, and comprehensive analysis is often lacking. Traditionally, educational research has focused heavily on conventional, comprehensive school systems, which positions Alternative Education as a diverse and flexible option for students who do not thrive in mainstream environments. Alternative Education is often tailored to meet specific needs, provides pathways that differ from the standard educational model, and serves a wide range of students with unique challenges or learning styles.

A thorough examination of Alternative Education is essential to understanding the various programs, the students they serve, and the faculty and staff who implement the curriculum. While many studies focus on specific aspects of Alternative Education, this review synthesizes existing research to provide an overview of the field.

The purpose of this study is to consolidate existing data to create a general overview of the available information by discussing various definitions and types of Alternative Education programs. Next, this review will examine the factors influencing individual enrollment in Alternative Education, followed by an analysis of students and faculty. It will then explore the perspectives of both students and faculty on how Alternative Education compares to traditional comprehensive school systems.

The investigator employed a preliminary article inquiry in The University of Montevallo's EBSCO database. To search for relevant articles, keywords such as "Alternative Education," "Credit Recovery" and "Progressive Education" established the introductory data. Articles discussing international and special needs education are excluded from this inquiry. The references in the articles from EBSCO added to the final source log.

What is Alternative Education?

Alternative Education is difficult to define as there is no centralized definition that programs can use. In effect, Conventional Education aims to serve a broad range of students whereas Alternative Education serves students with a specific need. This distinction enables Alternative Education to function independently while remaining part of the broader educational framework. A few States have recognized definitions of Alternative Education, but they vary. The Federal Government defines Alternative Education as

> A public elementary/secondary school that addresses needs of students that typically cannot be met in a regular school, provides nontraditional education, serves as an adjunct to a regular school, or falls outside the categories of regular, special, or vocational education. (Sable, Plotts, & Mitchell, 2010, p. C-1).

Laudan Aron, Co-Director of Policies for Action and Senior Fellow in The Urban Institute, defined Alternative Education in a report to the U.S. Department of Labor as

> schools or programs that are set up by states, school districts, or other entities to serve young people who are not succeeding in a traditional public-school environment. Alternative Education programs offer students who are failing academically or may have learning disabilities, behavioral problems, or poor attendance an opportunity to achieve in a different setting and use different and innovative learning methods…
> (Aron, L.Y. (2006) An overview of Alternative Education. Report to the U.S. Department of Labor, Employment and Training Administration. Washington D.C.: Urbana Institute, pp. 1–34.)

The Federal description is the more broadly accepted definition of Alternative Education as it allows flexibility to create a particular environment for student success. However, this definition can be misconstrued for any program that exists outside the sphere of comprehensive education as there are no objective program characteristics outlined. Aron's definition establishes specific criteria for both students and programs to identify the key aspects of Alternative

Education. The goal is to justify its existence and purpose as a system designed to support students struggling academically. It can be argued that any type of "Non-traditional" education can be considered Alternative Education, but this review is aimed towards the target demographic in the second definition: Students who are failing academically, have learning disabilities, behavioral problems or poor attendance. These students are categorized as "At-Risk" by their home schools. A counselor identifies a student as 'at-risk' by assessing grades, attendance, and teacher reports. They then schedule an intervention meeting and recommend an Alternative Education program that best fits the student's needs.

In a report to the US. Department of Education, Alan Porowski, A fellow at ICF International, identifies four dimensions that define Alternative Education.

- Who the program serves

- Where the program operates

- What the program offers

- How the program is structured

These dimensions offer programs the opportunity to construct curricula that target distinct student bodies with needs. Alternative Education programs can differ from one another and can be governed by local, state, medical or governmental entities to deliver unconventional education to students who fit the target demographic.

Alternative School Characteristics

With these definitions in mind, exploring key aspects of Alternative Education-- the students, the structure, and spaces these programs occupy--will provide a clearer understanding of how an

Alternative Education school typically operates, However, specific programs may vary in their approach and design.

Programs offer each student a path toward earning a high school diploma, a GED, or an occupational degree (Foley & Pang, 2006; Porowski et al., 2014). Each of these pathways has different goals and methods for achieving these ends, showcasing the variety of Alternative Education models available. Some common characteristics that emerge include:

- **Smaller class sizes,** and lower student-teacher ratios

- **Smaller physical venues** (or online settings)

- **Altered class schedules**, such as reduced class times or school days, or atypical start and end times

- **Modified curricula**, tailored to meet specific program goals

Nationally, the increasing size of traditional classrooms has become a concern. Smaller class sizes enable teachers to provide more individualized attention and support to students, fostering personal relationships and addressing the needs of students who may have struggled in larger, more impersonal environments. Similarly, alternative schedules may align better with students' personal circumstances or learning rhythms, which can improve attendance and engagement (Foley & Pang, 2006; Lagana-Riordan et al., 2011; Porowski et al., 2014).

Curricula that focus on earning a high school diploma or its equivalent often emphasize core subjects like math, science, English, and Social Studies. Graduation requirements may be altered, with some programs reducing or eliminating the need for extracurricular or creative subjects

such as art, drama, and music (Foley & Pang, 2006; Porowski et al., 2014). Programs aimed at occupational degrees, on the other hand, integrate specialized training to prepare students for the workforce, offering a highly focused curriculum that aligns with career preparation.

While the defining traits of Alternative Education programs highlight their flexibility and adaptability, it is equally important to focus on the unique students who thrive in these nontraditional environments. This fluidity does not suggest that Alternative Education delivers a lower-quality experience; instead, it reflects the ability to tailor learning to meet students' needs in ways that traditional systems cannot.

Alternative Education Students

While the defining characteristics of Alternative Education programs provide insight into their flexibility and adaptability, consider the atypical students who benefit from these unconventional environments. Students are enrolled in Alternative Education for a variety of reasons: academic, behavioral, or personal challenges (Foley & Pang, 2006; Lagana-Riordan et al., 2011; Porowski et al., 2014). This section analyzes the backgrounds and causes of student enrollment in Alternative Education, highlighting diverse reasons why these programs offer a vital lifeline for many.

Before exploring the specific challenges faced by students in Alternative Education programs, emphasis must be placed on gender and race disparities. Certain demographic groups are over-represented in Alternative Education, particularly Latino and African American Males aged 16-19 (GAO-20-310, K-12 Education: Information on How States Assess Alternative School Performance, 2020) . For example, African American and Latino students are disproportionately placed in these programs, often because of systemic inequalities in discipline, academic support, and access to resources provided by traditional schools when these racial

minorities already experience the lowest rates of graduation (Aron, 2006; Lagana-Riordan et al., 2011). These disparities in racial representation reflect broad inequities within the traditional education system and play a significant role in shaping the demographics of Alternative Education before students reach a critical need for intervention. Consequently, these programs must address the diverse needs of students who face challenges, both academically and personally.

Students enroll in Alternative Education programs for a variety of reasons usually resulting from difficulties that make success in traditional schools more challenging. Academic struggles are among the most common factors, with many students failing to meet grade-level expectations or experiencing repeated failure in key subjects such as math and reading (Porowski et al., 2014). Behavioral issues also play a significant role, as students with disciplinary histories, truancy, or ongoing conflicts with teachers and peers are often directed to alternative programs. Beyond academic and behavioral difficulties, personal circumstances—such as socioeconomic hardships, unstable home environments, or mental health challenges—further complicate students' ability to thrive in comprehensive educational settings. For these students, Alternative Education offers a chance to rebuild their academic standing and personal development in a more supportive and flexible environment.

Repeated academic failure often leads to disengagement, causing students to lose both motivation and confidence in their ability to succeed. This can worsen emotional and behavioral issues contributing to enrollment in Alternative Education. Many students entering these programs struggle to regulate their emotions or manage behavioral issues in traditional school settings. Dysfunction can lead to frequent conflicts with peers and teachers, disciplinary actions, or expulsion. For some, these behaviors stem from personal trauma, mental health issues, or

difficult home environments, creating a cycle of disengagement and frustration in conventional schools. Students often report feeling misunderstood or unsupported in such environments, which exacerbates their emotional challenges and makes academic success seem unattainable (Zolkoski et al., 2016). The flexibility of Alternative Education allows these students to reset in a space where educators actively address their needs, helping them break free from patterns of negative behavior.

Alongside emotional and behavioral challenges, personal circumstances can also influence a student's decision to enroll in Alternative Education. Many students face difficult situations outside of school such as unstable family environments, homelessness, or financial hardships, which make success in traditional schools difficult (Engelmann, 2022; McNulty & Roseboro, 2009; Sperling, 2019; Zolkoski et al., 2016a) . These personal issues can lead to poor attendance, lack of focus, or an inability to keep up with coursework. For some, their academic challenges are not just about classroom difficulties but are compounded by life circumstances that create constant stress or distraction. In such cases, the structure and demands of conventional schooling may feel impossible to manage, driving students to seek options in which their personal challenges are recognized and accommodated. Thus, Alternative Education, with its flexibility and accommodations, can provide an environment for multiple areas of focus and rehabilitation

Alternative Education Perceptions

Students For a student, going to an alternative school can be deeply personal as students perceive it as their last chance to graduate. Students transitioning from comprehensive schools to Alternative Education often bring with them past experiences of frustration and isolation in traditional settings. Many describe feeling invisible, overlooked by teachers, and misunderstood

by peers. Academic struggles in comprehensive settings frequently lead to stigmatizing labels such as "failure" or "troublemaker," creating a negative self-perception that makes it even harder to succeed. One student expressed contrasting views of their traditional and alternative school.

> I feel like I'm doing better here, like, with my classes and everything. It's like a perfect school for me, I guess. I fit in perfectly here. And I felt like in my old high school, I didn't fit in at all, like, with all the other kids and everything else, like, teachers actually care about you here. Not like traditional high school (Sperling, 2019).

This sense of disconnection, coupled with the pressure to conform to conventional academic norms, leads many students to disengage from the education process. Students start skipping classes or exhibit behavioral issues as a response to an environment they perceive as unsupportive.

Alternative Education offers a new setting, one in which students experience more personalized attention, a supportive environment, and the chance to rebuild their academic identity. This shift in perception, from feeling like an outcast to being recognized as someone with potential, constitutes a crucial factor in understanding why many students find success in Alternative Education after struggling in traditional settings. In contrast to their experiences in comprehensive schools, these students often find a sense of belonging and support that significantly enhances their educational journey. Smaller class sizes, individualized attention, and nurturing environments foster personal connections among students and teachers, helping students feel seen and valued. Such sentiments illustrate how Alternative Education can address the emotional and social needs of students who previously felt disregarded by comprehensive education (Foley & Pang, 2006; McNulty & Roseboro, 2009; Murray & Holt, 2014; Sperling, 2019; Zolkoski et al., 2016b).

Faculty Alternative Education staff are not immune to the external stigma that students face surrounding these programs. However, many educators maintain a profoundly positive perception of the students they serve and the relationships they foster. In one instance, a school counselor highlighted positive perspectives on Alternative Education students, along with the biases held by teachers outside of these programs. Often, comprehensive educators reinforce the negative stigma the students face, viewing a position transfer to Alternative Education as a form of disciplinary action or an attempt to push "troublesome" teachers out of a school system by sticking them with troubled students. However, many have revised their views and expressed regret for their previous negative perceptions (Hernadez, 2021) Alternative Education educators often cultivate strong, supportive relationships with their students. These nurturing bonds are essential, as they create a safe environment in which students and staff feel valued and understood (McGee & Lin, 2020)

Discussion

The use of the term "Alternative Education," often carries a negative connotation, implying it as the least favorable option. While this perception is problematic, it is important to recognize that Alternative Education encompasses a wide range of valuable programs, including credit recovery, juvenile justice, and other specialized subjects that cater to diverse student needs and circumstances. Beyond these perceptions, this argument focuses on the flaws of comprehensive education and the role of Alternative Education programs.

The case for Alternative Education is rooted in its justification as a response to the failures of traditional systems. These systems, framed to serve the majority, cannot accommodate those who deviate from conventional ideals in behavior, learning styles, or circumstances. If Alternative Education is seen as the solution to the flaws of comprehensive education, then it

raises the question of why can't the successful strategies and solutions of Alternative Education be integrated into comprehensive education systems to address these same issues on a broader scale? However, there is no proactive approach in place within traditional education systems to identify and support students before they reach a point at which alternative schools are needed to redirect their education. This reactive approach highlights the failures of comprehensive schools. Instead of providing the necessary resources and strategies from the beginning, comprehensive education often leaves students to struggle, leading to the creation of alternative programs designed to pick up the pieces after students have already disengaged. This perspective suggests that the real issue lies not with the students, but with the shortcomings of the education system. By offering personal, flexible, and empathetic learning environments, Alternative Education positions itself as a haven for students considered unworthy of remediation. It reclaims the potential of these marginalized learners, helping them thrive academically, socially, and emotionally.

While the success of Alternative Education programs is measured by the number of students who enroll and obtain a high school diploma or equivalent, there is a lack of data on what these students achieve after graduation. Assisting students toward graduation is the primary focus of the programs, with little evidence of concurrent efforts to prepare them for higher education or careers. General data exist on average lifetime earnings based on the highest education level attained, comparing high school dropouts, graduates, and college graduates. However, there are no comprehensive data or broader context specifically addressing the outcomes of adult graduates from Alternative Education programs. With an already large minority population, a lack of focus in post-graduate assistance perpetuates a system of racial inequities. When the comprehensive system fails to meet their needs, students are sent to

Alternative Education schools to "just get them to graduation" without proper preparation for life after high school. These observations and arguments call for additional research.

In the context of the investigator's personal experiences, Alternative Education has been a life-changing experience. Although graduation once seemed unattainable, it became a tangible goal through the support and structure provided by an Alternative Education school. Many of the characteristics, outcomes, and people described in the literature are strikingly familiar. There is acknowledgment that Alternative Education positively impacted the academic trajectory of the researcher, and there is recognition of the program's limitations. Although the program may lack sufficient preparation for higher education, another research path may question whether the desire to pursue higher education stems from personal strength or is instilled by the very system designed to help students recover academically.

In its various forms, Alternative Education can and does provide a lifeline, offering opportunities that might not otherwise have been available. However, the focus on high school graduation often comes at the expense of preparing students for what lies beyond. This duality reflects the tension inherent in Alternative Education. It can be life-changing, but it is also limited in scope.

In addition to personal experiences, details outlined in the research reflect the researcher's interactions with students and teachers. The students, many who previously struggled in traditional settings, found hope for success in the supportive environment provided by Alternative Education. This hope was not limited to academic achievement but encompassed the belief that they could overcome challenges that once seemed impossible. The teachers, in turn, found immense pride in their work, as they witnessed firsthand the transformation in their students. Their dedication to helping students succeed went beyond educational instruction,

providing the kind of personal attention and encouragement that many students had never received in more conventional settings.

Limitations

The broad definition and interpretations of Alternative Education differ depending on local needs and program structures. The term Alternative Education describes a diverse range of programs: Mental and Behavioral Health schools, dropout prevention programs, Continuation Schools, charter schools, and homeschooling. This broad scope makes analysis across Alternative Education settings difficult, as specific characteristics, objectives, and student populations vary from one program to another. Without a more unified and exact definition, people may group different forms of Alternative Education together, obscuring key differences that could be vital for understanding their individual structure and purpose.

The available literature on Alternative Education is insufficient, particularly in large-scale studies or long-term research that could provide a more comprehensive view of the field. Much of the existing research focuses on case studies or specific communities. While valuable, this limits the ability to draw broader conclusions about Alternative Education as a whole. This lack of available data means that many of the findings are context-specific and may not reflect the diversity of Alternative Education programs across different states or populations. There is also a significant lack of data regarding Alternative Education students beyond their programs. Both require additional study.

Another limitation of this research lies in the potential biases of the researcher. With an academic background in Alternative Education and personal experience in continuation high school, the researcher has had direct contact with many of the students, staff, and programs discussed in this review. Personal observation of peers' struggles, aspirations, and personal

challenges has influenced the research perspective. While every effort has been made to approach this review objectively, honoring the individuals who supported and believed in the researcher during difficult times, may have shaped the interpretations and overall conclusions of this work.

Conclusion

Alternative Education is a unique and special sphere in education, offering the ability to deliver curricula through non-traditional means. This unconventional method allows the space for students to thrive when comprehensive education has failed. These shortcomings stem from a lack of appropriate and timely recognition of issues encountered by students. Often, the remedy to this late intervention is enrolling in a program that can lower drop-out rates. These students, overrepresented by Hispanic and African Americans, can be admitted into an Alternative Education program for a variety of reasons: mental health, credit recovery, juvenile justice, etc. These factors align as negative environmental consequences that Alternative Education addresses through transformed approaches to delivering education. Smaller institutions allow personal connections to thrive; in turn the student has a consistent and stable relationship with an individual whom they can trust. Despite external negative social perceptions that label students as 'lost cause' options or 'dumb' students, both students and teachers have reported higher levels of self-worth and satisfaction in their environment. This suggests that the value-potential of these programs extends beyond the narrow judgments imposed by society.

This review shines a light on the complexities and impacts of Alternative Education. The goal of presenting this information is to make it accessible to all as education should be a conversation that engages everyone, not limited to those who have first-hand experience in the field. Alternative Education has fallen victim to negative social perceptions, and these attitudes

hold no value in improving or creating a positive constructive dialogue. The researcher hopes

this review opens doors for deeper understanding and thought-provoking insight into the

importance and impact of Alternative Education on the population that it serves.

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The Challenges to Emotional Vulnerability

By: Taylar Barganier

ABSTRACT

In society today vulnerability is depicted as sensitivity or something that everyone has grown to dislike due to discomfort. In many cases it is seen as a weakness and showing a part of yourself that can be judged harshly and produce pain. As seen today when someone is vulnerable with another person they can fear that they will approach them differently or alter how they perceive the person. However, many people are afraid to become vulnerable and share their emotions with another person. How can we achieve a safe space to not be fearful of vulnerability? Or further, why are people afraid to be vulnerable? The hypothesis of this research is the possibility of race, religion, or other demographic characteristics altering the perception of safety to be vulnerable. As well as most agreeing with how society gives backlash or how hard it is to be vulnerable in the go-getter society that is seen today.

The purpose of this research is to bring awareness as to how society perceives vulnerability and how we can adapt to the change that vulnerability is normal. Ways to research this topic include a qualitative research design where communicating and asking questions to understand how different age groups view vulnerability or the ways in which they would want to see change. Results will vary and the conclusion is yet to be determined, however, the future of this research might alter the perception of being a vulnerable human. It can also determine why many are afraid of vulnerability.

INTRODUCTION

Vulnerability is defined as a "susceptibility to psychological harm and a possible state of fragility or emotional hurt" (Yamaguchi et al., 2022, p. 1). "Vulnerability can also be classified as the emotional pain that is a part of the human experience" (Yamaguchi et al., 2022, p.1).

Emotional vulnerability is how people can connect with others and themselves as they enter new or improve their current relationships

I chose to do my study on emotional vulnerability as I've always been fascinated by why many people are afraid to be themselves and thus creating fear around being a human being. I've always known there are different parts of us that make up a whole picture, but as society grew and social media took a stance, fear of being yourself and the feeling of shame surrounding emotions took hold.

There are different types of ways vulnerability can be shown. Seven of them are: Remorse, Diluted relationship, Pressure, Difficulty to refuse, Regret over procrastination, Avoidance/escape, and Susceptibility to critique (Yamaguchi et al., 2022, p. 1).

Remorse can be depicted as an emotion itself that many people can feel based on an event or action that takes place. Based on the text the emotion refers to content that expresses discouragement based on personal incompetence and the poor execution of an event (Yamaguchi et al). When faced with a decision, the action an individual takes that is unacceptable in nature can cause the vulnerable feeling of remorse to appear. As stated in the text, "answers regarding emotionally hurtful events that expressed remorse included 'I feel inferior compared to others', 'It will hurt if you show your feelings on your face', and 'I will carry my mistakes around forever'" (Yamaguchi et al., 2022, p. 2). In the study itself, remorse was shown by participants when experiencing hurtful events that they blamed themselves for (Yamaguchi et al., 2022, p. 2).

Diluted relationships can be expressed by the word diluted where these relationships cannot take progress due to doubts and unacceptance. The term refers to instances where participants expressed being emotionally hurt by interpersonal relationships (Yamaguchi et al., 2022, p. 2). Some examples of thought patterns are "I do not get on well with friends," "I feel like I am out of place," and "The other party's reply is slow."(Yamaguchi et al., 2022, p. 2). The

participants exhibited vulnerability to psychological damage and past harm or anticipation of future pain (Yamaguchi et al., 2022, p. 2).

Pressure can be defined as the feeling of an intense amount of heavy weight applied to an individual based on their own thoughts and emotions (Yamaguchi et al., 2022, p. 2). The term refers to being emotionally hurt by tension and excessive anxiety. They measured pressure in a person by asking participants to rate their agreement with questions and their responses were "I feel sick when I am responsible for something," "Speaking in front of many people makes me nervous," and "I am scared to fail," (Yamaguchi et al., 2022, p. 2). Based on the participants in the Yamaguchi, et al. study they experienced emotional pain in tense situations(Yamaguchi et al., 2022, p. 2).

Difficulty to refuse is a more complex action with words where denying or refusing something is complicated for a person to attain. The phrase refers to having trouble in actively declining a request or invitation from others; it describes the emotional pain the participant experiences when refusing a request (Yamaguchi et al., 2022, p. 2). Within this phase of vulnerability denying a request is based on the fear of how a person will react. As stated in the text, " The inability to explicitly refuse a request or invitation indicates weakness or fragility." (Yamaguchi et al., 2022, p. 2). Some responses indicated "I cannot argue/I cannot oppose," "I cannot refuse/I am pitiful if I cannot refuse," and "I do not want to be disliked/I cannot decline an invitation" clearly showed participants' susceptibility to interpersonal damage (Yamaguchi S. et al).

Regret over procrastination is the idea that with any event or situation excessive thought or emotions take the form of procrastination. When faced with difficulty, the approach of how to access the circumstances presented is struggle and battle amongst the mind and emotional fragility. The term refers to feelings of regret or remorse caused by the participant's negligence

(Yamaguchi et al., 2022, p. 2). Some answers from participants in Yamaguchi's study expressed, "I do nothing when I am alone," "I am tired and cannot do that/I do not want to do it/I have to do it, but I do not," and "I do not want to do anything."(Yamaguchi et al., 2022, p. 2). Participants' expressed feelings of disgust toward themselves, conveying a sense of hurt (Yamaguchi et al., 2022, p. 2).

Avoidance/Escape as presented is the state of mind of not hearing, don't see it, don't have to give attention to said situation. The phrase refers to avoidance of emotional hurt by escaping an event (Yamaguchi et al., 2022, p. 2). When challenged in an environment where words and actions must be presented during an event; the feeling of not wanting anything to do with it at all in order to escape harm is formed. Some responses from the text include, "I want to run away/It is not convenient for me," "I will procrastinate/I give up," and "I cannot keep it going" showed that, rather than taking action and experiencing pain, the participants tried to minimize damage by escaping." (Yamaguchi et al., 2022, p. 2).

Susceptibility to critique deals with feedback or suggestions from others, but taken by an individual as doubt or judgment. The term describes being emotionally hurt by the opinions and evaluations of others (Yamaguchi et al., 2022, p. 2). As stated from the text, " Answers that showed participants' tendency to feel hurt by others' opinions included "I am directly told bad things about myself" and "my personality/existence/opinion was denied." Within these thoughts are examples of being vulnerable and exposed to situations and the word validation comes up as a sense of further critique against self.

In addition the newly developed Emotional Vulnerability Scale for university students identifies four key factors of vulnerability: "vulnerability toward criticism or denial," "vulnerability toward worsening relationships," "vulnerability toward interpersonal discord," and "vulnerability toward procrastination and emotional avoidance." "This scale can be useful to

understand vulnerability in everyday situations and grasp the vulnerable conditions experienced by individuals." By examining these factors, researchers and educators can better understand how vulnerability manifests in students' lives and provide targeted support. Furthermore, "vulnerable individuals display a negative interpretation of life events only when they are confronted with certain stressors, which places them at high risk for depression and other diverse negative outcomes." Recognizing these patterns allows for the implementation of interventions that can mitigate these risks and promote emotional well-being among university students.

I wanted to grasp the idea of why it is challenging to be emotionally vulnerable and with the information I eventually want to educate others and make those who find it difficult feel more seen. My goal entirely is expanding upon what it means to be human, how to teach others to express themselves, and appreciate their own journey with healing and growth. Thus, starting with emotional vulnerability was the first part in my study of how to make this happen.

LITERATURE REVIEW

Among many articles, vulnerability, has been set to be seen as a tolerance to uncertainty (Raymond, et. al.,2021). A trait that can be one cause of anxiety, PTS, or depressive symptoms aimed to better understand the impact of distress on a person's socio-emotional vulnerability (Raymond, 2021, et. al.). On a systematic scale the need to understand one's vulnerability and their protective factors are significantly important to how a person faces daily adversity (Raymond,et. al.,2021) In hindsight it is to the authors understanding that if able to understand one's distress towards being vulnerable in any situation, the determining factor can aid in why many human beings are opposed to it.

The word vulnerability can invoke immediate discomfort. "Vulnerability, specifically emotional vulnerability, can mean exposing ourselves and allowing for potential emotional pain." This discomfort often stems from a fear of being judged or viewed differently for sharing

our deepest fears and insecurities. "We may even think we will be judged or viewed differently for sharing our deepest fears and insecurities. Or, in what's similarly distressing, we may worry that others will invalidate our feelings and brush them aside." However, when viewed through a more optimistic lens, having a healthy relationship with vulnerability can be a significant and essential component of building a healthy, kind, and compassionate relationship with ourselves. By embracing vulnerability, we allow for genuine connections to develop, fostering trust and support in our relationships. This act of pretending and hiding our true selves can ultimately bring about the outcome we fear most, as we don't allow for a genuine connection to develop. Understanding and accepting vulnerability can transform our interactions and lead to more meaningful and supportive relationships.

Based on the findings by Brene Brown in her own research on the power to vulnerability; she finds connection to be the center of why as humans everyone is here. She emphasizes how connections are what gives people a person and meaning to their own lives. As stated in the video, " The thing that underpinned this was excruciating vulnerability. This idea of, in order for connection to happen, we have to allow ourselves to be seen, really seen" (Brown, 2011). The problem she states that undermines this approach is people are afraid to form a connection with others out of fear of not being worthy of that connection they seek (Brown, 2011). When faced with this adversity it is hard to even predict the outcome of how seeking that connection will go and in turn creates that fear and inhibits a natural connection to form.

Furthermore Brene Brown specifies her mission to control and predict falled through and an epiphany occurred where she realized the way to live is to stop controlling and predicting (Brene brown, 2011). The way to even form a connection or be vulnerable is to allow natural things to happen and take place even if a person doesn't know the entire outcome. When trying to control or predict it prohibits you from learning how to grow and ultimately pull back from

future connections or even themselves as an individual. Brene Brown specifies how each individual is living in a vulnerable world and one strategy that many use to cope is numbing their own vulnerability. Ultimately, this brings her to the conclusion, " You can't numb those hard feelings without numbing the other affects, our emotions (Brene Brown, 2011). All emotions are a part of a human being's journey and numbing any part such as vulnerability. Numbing can be damaging to all the other parts of a person who will have a difficult time being able to understand themselves.

However, as seen in the article, *Grayson Perry and the recalibration of masculine emotional reactions to vulnerability and healing,* men exemplify a crucial shift in the perception of masculinity by openly addressing their vulnerabilities.

> "The shadow is a moral problem that challenges the whole ego-personality, for no one can become conscious of the shadow without considerable moral effort. To become conscious of it involves recognizing the dark aspects of the personality as present and real. This act is the essential condition for any kind of self-knowledge, and it therefore, as a rule, meets with considerable resistance." (Stormzy, 2020, p. 448).

For instance, acknowledged the intentionality behind his openness about mental health struggles, aiming to offer hope and solidarity through his music. "Stormzy acknowledged hope in communicating his own depression in music and elsewhere might be meaningful to others, thereby revealing an intentionality of values in his creative process. 'If there's anyone out there going through that, I think that for them to see that I went through it would help'"(Stormzy, 2020, p. 449) Together, these quotes illustrate how recognizing and sharing one's struggles not only fosters self-awareness but also serves as a powerful tool for connecting with and supporting others.

Furthermore, when it comes to men of color as seen in the article there tends to be an issue of seeming weak or the foundation of how they grew up to not trust others. Programs play a crucial role in addressing the emotional and academic challenges faced by men in higher education. "Men of color programs are important because they provide tools for men to share their emotions and create spaces for staff members and peers to validate them once shared" (Huerta, 2022, p. 52) This support system is essential given the social pressures that often compel men to hide their true selves. "Often, men in college feel that they must wear figurative masks to protect themselves from teasing or harassment from peers" (Huerta, 2022, p. 53) By fostering environments where emotional vulnerability is accepted and encouraged, these programs help men of color build meaningful relationships and engage with support services on campus, ultimately contributing to their overall well-being and academic success.

In addition, although there is extensive literature about prioritizing the safety and emotional well-being of research participants, much less has been written on the topic of researcher vulnerability. "This vulnerability led to burnout and vicarious trauma where I felt like 'a passive bystander after hearing graphic descriptions of violence, neglect, and physical, sexual, and emotional abuse day after day'" (Woods, 2022, p.81) This highlights the critical need for institutional acknowledgment and support for researchers who engage with trauma-triggering subjects. Recognizing and addressing researcher vulnerability is crucial, as "insights from such scholarly work exploring researcher vulnerability can lead to better support for the well-being of researchers via implementation of policies, processes, and strategies to reduce harm and promote coping skills and healing at the individual and institutional levels" (Woods, 2022, p.73) By implementing such measures, institutions can help mitigate the negative impacts of vicarious trauma and burnout, ensuring that researchers are equipped with the necessary resources and strategies to manage their emotional health effectively.

Apart from this, investigating nuanced relationships among character strengths, resilience, and psychological vulnerability can contribute to a better understanding of well-being and ill-being. "One prominent example of such risk factors is psychological vulnerability, which is defined as the set of cognitive schemes that increase the sensitivity to stress and leads to a sense of dependence upon success or the approval of others" (Demirci, 2019, p. 5627) This vulnerability can be shaped by various factors, including genetic predispositions, personality traits, past trauma, socio-economic disadvantages, lack of social support, and developmental issues. "Genetic factors, personality traits, psychopathology story, traumatic events (Wang, 2006), disadvantaged socioeconomic status, lack of social support and developmental problems (Mechanic and Tanner, 2007) play important roles in the formation of psychological vulnerability" (Demirci, 2019, p. 5627) By understanding these contributing factors, we can develop targeted interventions to bolster resilience and mitigate the impact of psychological vulnerability, ultimately promoting better mental health outcomes.

Research indicates that psychological vulnerability is significantly influenced by social circumstances. "Psychological vulnerability may be accepted as an inevitable result of being human, and all human beings are susceptible to psychological problems" (Yelpaze, 2021, p. 369). This vulnerability manifests in individuals who base their self-esteem on external validation, making them more prone to stress and negative emotions in response to life events. "Individuals who are psychologically vulnerable are likely to be overly stressed by life events; therefore, they might have more negative emotions, negative schemas, and a tendency to psychological disorders" (Yelpaze, 2021, p. 369). Recent studies further highlight that lack of social connections can exacerbate psychological vulnerability, contributing to poorer mental health outcomes. This vulnerability disproportionately affects disadvantaged groups,

underscoring the importance of social connectedness as a protective factor against psychological distress and promoting overall well-being.

The findings highlight that vulnerability, particularly stemming from a sense of being different, sensitizes individuals to inequalities and fosters a deeper sense of responsibility towards caring for others. "Our findings indicate that vulnerability—arising from a sense of being 'different'—contributed to sensitizing individuals to inequalities and further prompting a sense of responsibility to care with others" (Johansson, 2022, p. 318). Rather than fostering caregiving through institutional roles alone, embracing one's own embodied vulnerability can cultivate more egalitarian relationships rooted in empathy and mutual understanding. "Hence, instead of promoting practices of 'care taking' through, for instance, a certain institutional position, caring through one's own embodied senses of vulnerability may promote equal intersubjective relationships grounded in caring and feeling with rather than for others" (Johansson, 2022, p. 318). This perspective acknowledges that our inherent vulnerability enables us to recognize and empathize with others' needs, fostering genuine connections based on shared human experiences and mutual support.

METHODOLOGY

In order to answer the research question of why it is challenging to be emotional vulnerability, evaluating what kind of research design emotional vulnerability would require was the initial response. Qualitative research design best fits the entire objective of what the research questions suggest. In order to gain valid data having interviews or responses to the questions as open ended would be substantial data. Once interviews were conducted evaluation of the transcripts, body languages, and responses to the questions directly in a doc, we're further examined to decipher what was most in common or different. Then all interviews were put into a word cloud where the most used words were then shown.

First step was to gather participants for a qualitative research study that was determined based on how open ended most of the questions are. When gathering the participants diversity was the main priority among also inclusion of many different age groups. Emails, referrals, and simply asking around was the initial part of gathering subjects. After receiving at least seven the interviews were then conducted based on their comfort level. Four were recorded interviews where body language was visible and being able to hear their responses. While others preferred more anonymity to their responses and preferred typing their answers asynchronously rather than speaking. Hence these three subjects were considered more open ended responses than an interview itself. Prior to conducting interviews, consent forms were sent out and direct conversations were made to inform them of the questions and background of the research intel.

The group of participants that were chosen were diverse individuals ranging from male, female, race, sexuality, and types of environment. Each individual assessing their own perspectives through their different backgrounds were substantial to the research.

When the interviews were finished, they were assessed to find a common theme. By finding similar words used such as foundation, trust, and household environment, configuring the common theme ultimately produced substantial results of why vulnerability is challenging or what causes it.

RESULTS
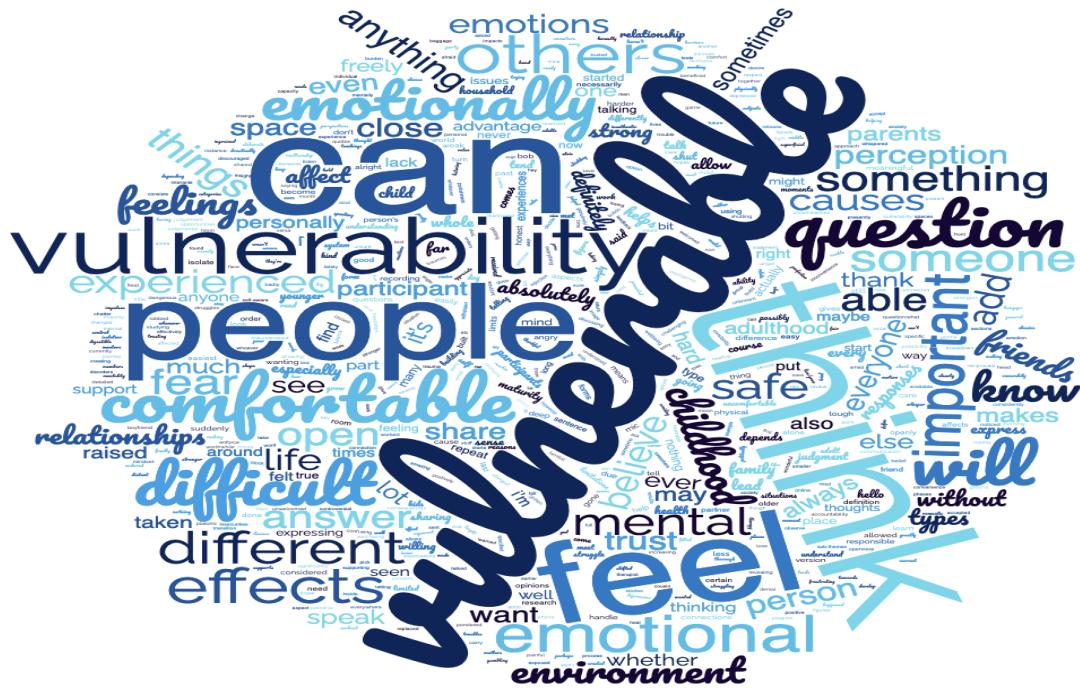
Table 1: Word cloud

When all interviews and responses to questions were finalized the transcripts were then put into the word cloud form where all the words that had been repeated by all subjects were finalized. The larger the words the more those were being the most said in each interview. Some words most said were vulnerability, environment, difficult, comfortable, feel, different, and effects. The way to interpret the data is by understanding these words were used the most. This means most of the people interviewed felt strongly towards the environment being one of the causes of vulnerability- how a person is raised. Difficult versus comfort depending on the situation and if they are comfortable with the people they are around to be vulnerable or is it difficult if in an uncomfortable setting.

From one interview they expressed, "If they've been taken advantage of. That causes a person to shut down and not let anyone in". When expressing this statement, it is clear that a part of comfortable and difficult situations can also depend on thoughts of will someone take advantage of the other when a person decides to be vulnerable. Within another interview with participant three, I asked the questions, do you think being vulnerable is different why or why not? Their response was, "I know personally it has always been difficult for me to be vulnerable with others. It was drilled into my head when I was younger that being open with your emotions was not welcomed or was considered baggage to others". As indicated from participant three the way a person is raised in how to view vulnerability is exactly what will be presented when that particular person makes other connections.

DISCUSSION/CONCLUSION

In order for us to make changes in how we view ourselves and how we connect with others it's important to understand what can cause someone to not feel connected, understood, or even want to reach out to others to feel seen. Our role in life is influenced by how we interact with others, and since vulnerability is a part of it, how can we implement ways to express this to others or work towards it. Vulnerability teaches us the importance of being comfortable with ourselves, family, friends, or relationships.

Connecting is a part of our drive based on Brene Brown's own research herself. To feel disconnected makes it harder for an individual to feel worth. A person's upbringing was one of the key factors of what we can do as a society to ensure there is a safe space for others to confide in and learn to be vulnerable. From this whole research I learned vulnerability is beautiful. It is the way we trust, make friends, enjoy life by being comfortable in ourselves. If someone wants to learn this information it can be used in therapy offices, schools, or even work settings. Something surprising for me was how others were forthcoming with their responses. I truly

didn't think I would get long responses but to see others' passion about being vulnerable with themselves and others prove to me the importance of this entire study.

LIMITATIONS

This study had several limitations. The sampling method was not perfect and was chosen for convenience. The amount of interviews conducted was smaller than anticipated and the sample size could have been larger. The timeline of this study was also sped up due to unforeseen circumstances. Finally, the research and literature conducted on the topic of vulnerability was a new one and during future studies, I would have a greater understanding of the background of the topic.

FUTURE STUDIES

Future studies involving this topic could involve a quantitative component instead of long-form interviews. A 20-30 item questionnaire, sent out online, might be a better way to get a sample size near n=100. There could also be a quasi-experimental element of the sample and make it random sampling. For future studies I would like to expand on why human connection is important and how we can reverse that back to this study on vulnerability.

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Chironomids in the Southeastern United States: A Literature Review

Ren Dogwood Cater

Abstract.

Chironomids, an insect whose larval form is found in most bodies of water worldwide, are benthic macroinvertebrates that play a vital role in trophic structures as primary and secondary consumers. They are a highly speciose family, estimated to contain over 10,000 species across the globe. As their aquatic larvae develop, they shed chitinous head capsules which can remain embedded in sediment for over 100,000 years. These head capsules can be used for morphological and genomic species identification of local assemblages, as well as isotopic and chemical analyses. These uses combined with a firm ecological understanding of species-specific environmental requirements means that they can be utilized as bioindicators to assess ecosystem health, for paleoecological studies, and as model organisms for evolution-based research. They also impact human health in a variety of ways and are a necessary food source for many fish. Yet, there is a paucity of ecological research regarding chironomids local to the Southeastern US, which has inhibited environmental research across the region. This paper aims to briefly summarize the uses of chironomids, what research has been done regarding them in the Southeast, and to inform on potential avenues that local chironomid research could take in the future.

Introduction

Chironomids are Dipteran arthropods, commonly called non-biting midges, whose aquatic larvae are plentiful worldwide in both freshwater and marine environments (Ashe et al. 1987; Goldfinch and Carman 2000). The chitinous head capsules that they shed during larval stages are often preserved in sediment layers with enough identifiable physiology intact to provide high-resolution taxonomic identification (Mackey 1977; Ruiz et al. 2006). Chironomids are also typically available in sufficient quantities, even in environments with low productivity, to allow for statistical analysis (Larocque 2001). These analyses are used to interpret which environmental variables are responsible for their distribution, or even allow for the reconstruction of thermal temperatures ranging from historical to millennial time scales (Haskett Jennings 2021; Mayfield et al. 2022).

Chironomids are one of the most plentiful benthic macroinvertebrates in many freshwater environments (Duffy and LaBar 1994; Bauer et al. 2023), and therefore can serve as a pivotal link between primary producers and secondary consumers (Runck 2007; Hines and Gessner 2012). While photosynthetic organisms convert inorganic carbon into an organic form accessible to primary consumers, the nutrients contained within these producers are still unable to meet all the nutritional requirements of carnivorous animals (Thompson et al. 2012). Chironomids bridge this gap, transforming these nutrients into forms that all higher trophic levels depend upon (Cole et al. 2006). As they are often such a large component of a low trophic level in a single system, they play a large role in nutrient cycling and can be vital to the health of an ecosystem upon (Samuiloviene et al. 2019;

Mayfield et al. 2022). They are frequently used in the aquatic trade industry as fish feed, as they are a natural and substantive part of many fishes' diets (Wagner et al. 2012).

Chironomids are often one of the first macroinvertebrates to colonize newly established waterways, including those recovering from a long period of drought, and thus are vital in establishing a food source for predatory fish before introducing them (Swink and Novotny 1985). There also exist carnivorous Chironomidae, illustrating how chironomids have inserted themselves into many ecological niches (Silva et al. 2024). They are incredibly speciose, the family estimated to be comprised of over 10,000 species worldwide (Cornette et al. 2015).

Chironomids as Bioindicators

Despite being an incredibly pervasive insect worldwide, there is no single species of chironomid that dominates entirely in any given ecosystem, genetically or ecologically (Bund and Davids 1994; Árva et al. 2015). They are often greatly speciose even in a single small body of water, and thus can contribute greatly to species diversity in freshwater and wetland environments (Hamilton and Saether 1971; Warwick 1985; Costa and Melo 2008). Thus, species assemblage data gathered in an area will yield information regarding the ecosystem in its present state, and in its past conditions if the individual species' sensitivity to environmental changes is known (Lenat 1983; Kansanen et al. 1984).

Individual species are so sensitive to certain conditions that characteristic deformities of the mentum are used to assess for specific pollutants and contaminants in waterways (Di Veroli et al. 2014). They are also used to monitor the environmental health of an ecosystem, such as in water and sediment quality assessments (Summers Jr. and Gore

1981; Rosi-Marshall and Meyer 2004), as well as providing a history of the local climate due to known temperature parameters (Lombino et al. 2021). Environmental toxicity is evaluated using analysis of the species assemblages within a location, detailed chemical and physiological analysis of their remains, or even analysis of gene expression (Zhang et al. 2020).

All of these valuable uses for chironomids and their remains apply to conservation efforts, as well. The conservation of freshwater biota has been of particular concern in the last several decades, as the introduction of dams and chemical contaminants have wreaked havoc on natural ecosystems (Jelks et al. 2008; Linke et al. 2010). Chironomid species assemblages can serve as a proxy for evaluating an ecosystem's health, biodiversity, and indicate which protected species might be present in an environment, thus aiding conservation planning (Nicacio and Juen 2015).

Chironomids in Paleoecological and Climate Studies

As chironomid's chitinous head capsules are capable of being preserved in sediment for over 100,000 years, the geological record of this family's existence is rich and detailed (Walker and Elias 2023). With a comprehensive understanding of species ecology, assemblage data can be used to reconstruct paleoclimates and environmental changes throughout the Holocene, as well as recreate the geographical distributions of associated organisms which are not as well preserved in the geological record (Verbruggen et al. 2011; Stratman et al. 2013; Brooks and Langdon 2014). This could aid broad biogeographic theory, but also provide a precise record of glacial retreat (Haskett Jennings 2021).

When morphological identification of chironomid species assemblage history is paired with analytical tools such as isotopic analysis (Verbruggen et al. 2011; Lombino et al. 2021), this can aid understanding of topological alterations and natural disasters of the past that could yield valuable insight into how aquatic communities react to major shifts in climate (Pelletier et al. 2020; Kubovčík et al. 2021; Ni et al. 2022), such as those predicted to occur in the near future (Pound et al. 2020; Ebi et al. 2021; Brasswell et al. 2022).

Little research has been done regarding coastal chironomids, although marine and brackish species have been documented (Pinder 1995; Tang et al. 2022). As much of the Southeastern United States is substantially affected by its proximity to the Atlantic Ocean and the Gulf of Mexico, gaining a better understanding of saltwater chironomids and their role in the marine environment could prove useful to local fisheries, as a potential proxy to monitor toxicological conditions on the coast, or the relative populations of other species of interest, such as marine fish which consume chironomids (Howard 1982; Magnhagen and Wiederholm 1982).

Emerging areas of Chironomid Research

Chironomids influence human health in a variety of ways. As their life cycles are very similar to one of the most prominent pest species to humans, the mosquito, understanding and monitoring of chironomid populations can contribute to understanding of how to control the spread of mosquito-born diseases such as malaria, and articles relating to chironomids have been known to be published in the *Journal of the American Mosquito Control Association* (Cilek and Knapp 1992). Their egg masses are known to harbor diseases such as *Vibrio cholerae* (Laviad-Shitrit et al. 2020; Zhao et al. 2023), and the

emergence of large swarms have caused intense allergic reactions in some individuals (Nandi et al. 2014). *Chironomus calligraphus* has been recognized as a pest species in Georgia (Gray et al. 2012).

Genetic studies have recently been undertaken on chironomids with the aim to elucidate components of extremophile evolution (Kozeretska et al. 2022; Shaikhutdinov and Gusev 2022; Lucas et al. 2024). Chironomids provide an ideal candidate for this research as they have adapted to nearly every known environment on Earth, from arctic regions to vernal pools in which chironomid can aestivate during drought conditions (Grodhaus 1980). Some species are quick to develop in laboratory conditions, similar to the most common insect model, *Drosophilia* (Kozeretska et al. 2021; Reyes-Maldonado et al. 2021).

Ecological Research on Chironomids in the Southeast

Relatively little research has been conducted into chironomids in the Southeast. The most comprehensive gatherings of species data in the region dates from over twenty years ago, conducted for use in environmental monitoring programs by the Fish and Wildlife Service (Hudson et al. 1990) and by Epler (2001) regarding Carolina-based species. These records are useful and (particularly in the case of the taxonomic key compiled by Epler) thorough, but in need of updating, and provide very little information regarding the microhabitats and environmental factors linked to each chironomid species. Epler's works does, however, provide a necessary basis for Southeastern chironomid identification which can be used in conducting morphological identifications. This gives Southeastern scientists

the ability to recreate and validate ecological data gathered by other teams—a vital component of the scientific process (Bouter and ter Riet 2021).

Much of the research recently done on Chironomids in the Southeast (2001-modern) has related to quantifying and spatially examining their distribution as a major component of the macrobenthos (Hornbach et al. 1993; Arshad et al. 1998; Ramsey et al. 2007; Langdon et al. 2010; White 2014) or examining the predatory relationship between chironomids and local fish (Gido 2003; Alford and Beckett 2006). However, some studies conducted primarily prior to 1990 can serve as a basis for understanding the ecological requirements of specific Southeastern chironomid genera and species (Arshad 1980; Coler and Kondratieff 1989). The possibility of controlling pest species emergence through chemical means has also been explored in limited experiments within the Southeast (Arshad et al. 2008).

The Southeastern United States is environmentally enriched by a wide variety of habitats, from the Appalachian Mountains to the subtropical wilderness of the Florida Everglades (Ingram et al. 2013). Due to the incredible biodiversity present in the Southeast (Elkins et al. 2019), it is likely that there are many endemic species waiting to be identified, their unique attributes potentially capable of contributing to a broad variety of fields such as evolution, physiological adaptations, and gene expression in highly localized climates. The unusual traits of some Southeastern chironomids have already been shown (Furnish et al. 1981), such as a *Eukiefferiella* species which builds its larval tube casing from an aquatic moss (Imada 2020), and there are doubtless more to be discovered.

The Future of Chironomid Research in the Southeast

Despite the research presented here, relatively little is known about chironomids in the Southeast when compared to their European (Přidalová et al. 2024), South American (da Silva and Farrell 2017), African (Eggermont and Verschuren 2003), and Asian (Zhang et al 2013) counterparts. The ways in which chironomids are used for environmental, geographical, and biological research are clear, yet all hinge upon having a detailed understanding of the ecology of chironomids local to the area being studied. In the Southeastern United States, this baseline data has not been gathered in substantial quantity in the modern era, which severely impedes the progress of environmental understanding in the region.

To address this gap in knowledge and push chironomid-based research to its fullest potential in the Southeast, studies must be done regarding the conditions in which local species of chironomids live in the modern environment. While the collection of living specimens is an obstacle in many biological surveys (Tronstad and Tronstad 2024), particularly in lotic systems, the persistent nature of chironomid head capsules allows for ecological analysis to be conducted using only sediment cores, identification manuals, and the gathering of environmental variables to pair with the species found in each location (Ruiz et al. 2006).

In addition, long-term studies must be conducted on the behavior, life cycles, and seasonal variations in local chironomid populations (Grzybkowska et al. 2003; Reynolds and Benke 2006). This detail, which is unfortunately lacking in current research despite the efforts of some notable scientists, could improve the resolution and accuracy of conclusions

drawn regarding chironomid data. A geographical and anthropogenic perspective, in which broad human influences such as air and light pollution (Arshad et al. 1986) and the impact of fertilizer run-off are taken into account (Barmentlo et al. 2019), could provide valuable insight into how aquatic populations adapt to environmental change on a short-term scale (Hu et al. 2022), perhaps allowing for predictions regarding the resiliency of insects during future acute environmental crises.

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Exploring the Intersectionality of Socioeconomic Factors, Race, and Gender: Disparities in

Educational Outcomes for Black Male Students

Sidney Jones

Intersectionality in education examines how overlapping social identities such as race, gender, and socioeconomic status create unique challenges and experiences for students. This framework, particularly relevant in understanding the educational disparities faced by black male students, reveals how these identities intersect to produce compounded disadvantages. Socioeconomic status, commonly noted as SES, impacts access to resources and educational opportunities, while systemic racism and gender biases further exacerbate inequalities. Critical Race Theory, abbreviated as CRT, provides a lens through which we can analyze these disparities, emphasizing the need to address systemic issues within educational institutions. This research explores how these intersecting factors contribute to educational disparities for black male students and identifies effective intervention strategies to promote equity and inclusion.

Critical Race Theory (CRT) originated from critical legal studies and feminism in the 1970s and 1980s, positing that racism is deeply embedded in American law and institutions, inherently sustaining racial inequalities (Reed et al., 2022). CRT asserts that the law itself is a racist structure designed to maintain the status quo of racial inequality (Kolivoski et al., 2014). In education, CRT deconstructs systemic racism by promoting an inclusive and equitable curriculum, examining racial disparities in standardized testing, disciplinary actions, and resource allocation (Jones, 2018). Contrary to some criticisms, CRT does not seek to instigate racial divisiveness but rather highlights and addresses systemic inequities that persist in educational settings (Parson et al., 2018). Following societal events such as the death of George Floyd, there has been a shift towards incorporating more comprehensive histories that include the achievements and struggles of people of color, counteracting traditionally Eurocentric curricula that reinforce exclusion and negative stereotypes (Adger, 2021).

Systemic racism and socioeconomic disadvantages significantly impact educational outcomes for black male students. In her article, 'From the Achievement Gap to the Education Debt', Gloria Ladson-Billings emphasizes the concept of "education debt, which encompasses historical, economic,

sociopolitical, and moral components, highlighting accumulated disadvantages faced by marginalized groups over centuries" (Ladson-Billings, 2006). Historical debt refers to the legacy of educational inequities, such as the prohibition of education for enslaved Africans and the inferior resources provided to Black, Native American, and Latino students even after emancipation and desegregation. Sociopolitical debt involves the exclusion of communities of color from civic processes and decision-making mechanisms, impacting their educational opportunities as detailed by the U.S. Department of Justice from their 2006 study. Economic disparities manifest in the significant differences in funding between schools serving predominantly white students and those serving students of color.

Ladson-Billings' work in "Igniting Student Learning Through Teacher Engagement in Culturally Relevant Pedagogy" explores the systemic issues perpetuating racial disparities in American schooling. She highlights how traditional desegregation efforts often fail to address the particular needs of black students, leaving them alienated within educational systems that prioritize white interests (Ladson-Billings, 2018, p. 15). A key point of Ladson-Billings' work is the concept of culturally relevant pedagogy, which emphasizes empowering students through their cultural identities and experiences. She advocates for teachers to develop deep understandings of their students and their communities, fostering inclusive learning environments where all students feel valued and capable of success. In her book "The Dreamkeepers," Ladson-Billings profiles exemplary educators who embrace culturally relevant teaching practices, challenging the notion that African-American students are inherently deficient. Ladson-Billings criticizes the American educational system, arguing that racial inequalities persist due to institutionalized racism and inadequate resources in schools serving Black communities (Ladson-Billings, 2018, p. 20). She argues for a reconceptualization of educational equity, moving beyond simplistic explanations based on class or gender to confront the systemic racism embedded in schooling practices. Furthermore, the article "Through a Glass Darkly: The Persistence of Race in Education Research & Scholarship" (2012) examines the persistent impact of race in educational research through the lenses of psychology and eugenics. The concept of eugenics, introduced by Sir Francis Galton in the late 19th century, sought to

control and improve the racial qualities of future generations through selective breeding and social policies. Prominent figures like Lewis Terman, the inventor of the Stanford-Binet Intelligence Test, were advocates of eugenics, believing in the inherent intellectual inferiority of certain races. Terman's work, which excluded African American and Latino children, became foundational for gifted and talented programs, perpetuating a narrow and biased view of intellectual capability (Ladson-Billings, 2012, p. 45). Ladson-Billings critiques the social sciences for their complicity in racialized thinking, highlighting how sociology, anthropology, and psychology have contributed to racial stratification and educational inequities.

Dr. Tyrone Howard, in "Why Race and Culture Matter in Schools", adds to the importance of cultural competency among educators. He argues that understanding and respecting students' cultural backgrounds can significantly enhance their learning experiences. Cultural competency involves recognizing and valuing the cultural differences among students, which can help create a more inclusive classroom environment. Dr. Howard stresses that educators need to be trained in cultural competency to bridge the cultural gaps that may exist between them and their students. Continuous professional development for educators is necessary to sustain efforts in promoting racial and cultural equity (Clark & Zygmunt, 2016, p. 72). Dr. Howard suggests that schools should provide regular training and workshops on cultural competency, implicit bias, and anti-racist practices. Systemic racism is identified as a major barrier to educational equity. Dr. Howard explains that racism is not just an individual issue but is embedded in the structures and policies of educational institutions. These systemic issues often result in disparities in academic achievement, disciplinary actions, and access to resources for students of color. He provides examples of how racial biases in school policies and practices can disproportionately affect minority students, leading to a cycle of disadvantage (Clark & Zygmunt, 2016, p. 75). Additionally, Dr. Howard advocates for the recruitment and retention of a diverse teaching workforce, which can provide students with role models who share their cultural backgrounds (Clark & Zygmunt, 2016, p. 78).

The article "The Impact of Standardized Testing on the Racial Identity Development of Black Males Attending Middle School" by Shauna Procope reveals that standardized tests induce significant stress and anxiety among black male students, a phenomenon known as stereotype threat, which hinders their academic performance and reinforces negative stereotypes (Procope, 2023, p. 31). Procope utilizes the Racial Identity Attitude Scale (RIAS) based on William Cross's nigrescence model, which outlines stages of black racial identity development: pre-encounter, encounter, immersion-emersion, and internalization. The study found that all participants were in the encounter stage, recognizing and responding to racial dynamics affecting their lives. Interviews with her participants indicated that they experienced low expectations from teachers and themselves, contributing to a negative self-concept and adverse educational experiences. The findings show the detrimental effects of standardized testing on the psychological well-being and academic success of black male students, emphasizing the need for alternative assessment methods that affirm racial identity and accurately reflect students' abilities. Procope advocates for portfolio-based assessments as a viable alternative, allowing students to showcase their learning in a culturally relevant and affirming manner (Procope, 2023, p. 42).

To expound on the part that socioeconomic status plays in this issue, in the article "Evaluating the Relationships Between Poverty and School Performance" we can see how much poverty impacts school performance. The findings indicate a strong negative relationship between school poverty and student achievement, with about 50% of a school's achievement level accounted for by its poverty rate (National Center for Education Statistics, 2018). Higher poverty correlates with lower median student achievement percentiles. However, the relationship between poverty and student growth is weaker, suggesting that growth measures are less biased by student income levels. Schools with the highest and lowest poverty levels show different patterns of student growth. Despite this, many low-achieving schools demonstrate significant student growth, challenging the fairness of using achievement as the sole performance metric (National Center for Education Statistics, 2018).

When reading "Disrupting the School-To-Prison Pipeline: Using Culturally Responsive Classroom Practices to Support Black Students" the reader can begin to explore how the writing addresses the school-to-prison pipeline phenomenon, where black students are disproportionately funneled from the educational system into the criminal justice system. This is exacerbated by zero-tolerance policies and exclusionary disciplinary practices such as suspensions and expulsions, which disproportionately affect black male students. Exclusionary discipline practices significantly contribute to racial disparities in education and the criminal justice system. Black students are three and a half times more likely than white students to be excluded from school due to disciplinary issues and are twice as likely to drop out. These practices not only disrupt educational attainment but also increase the likelihood of incarceration, creating a vicious cycle (Hatcher et al., 2022, p. 140).

Last but equally as important, the study "Is There a Disproportionate Representation of African American Males in Special Education? A Causal-Comparative Investigation" highlights the overrepresentation of African American male students in special education programs. The findings indicate that African American males are significantly overrepresented in categories such as Emotionally Disturbed (ED), Specific Learning Disabled (SLD), and other low incidence disabilities. African American males constituted 68.2% of the male students identified for special education, while only 31.8% were female. Most students identified with disabilities were Black (80.6%), followed by smaller percentages of Hispanic (2.6%), Multi-racial (5.5%), and White (10.6%) students. This disproportionate representation highlights systemic biases in the identification and classification processes for special education, which often rely on subjective criteria and are influenced by racial stereotypes (Fenwick & Akua, 2013, p. 29).

Consequently, in education, these influences manifest in various ways. Psychological notions of normalcy and exceptionalism, sociological concepts of family and community, and anthropological ideas of cultural hierarchy all contribute to how race is treated in educational research. Ladson-Billings argues that much of this research operates within a deficit paradigm, viewing students of color through a lens of

failure and deficiency. This perspective ignores the successes and strengths of these students, as exemplified by Historically Black Colleges and Universities (HBCUs), which have produced many of the nation's most prominent African American intellectuals and professionals (Ladson-Billings, 2012, p. 50). Addressing educational disparities for Black male students requires a comprehensive understanding of the intersectionality of socioeconomic factors, race, and gender. Critical Race Theory provides a valuable framework for analyzing these disparities and identifying systemic issues within educational institutions. Effective interventions, such as culturally relevant pedagogy, early academic support, and culturally responsive practices, have shown promise in promoting equity and improving educational outcomes. By implementing these strategies and addressing systemic biases, we can create a more inclusive and supportive educational environment for all students, particularly those who are most vulnerable to systemic inequities.

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You Allow Them to Know as Much as You Want – An Undergraduate Latinx Perspective

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Abstract

In this qualitative study, I explored Latinx students' experiences in college. I took an interpretive turning points approach to identify the events that Latinx students perceived to be turning points during their college experiences. Fifteen participants shared events/experiences that shaped their perception of academic success during their academic journey. These events/experiences were categorized into three themes (motive, support, and goal acquisition) and eight sub themes. This study offers negative and positive feedback from participants regarding the turning points they experienced during their academic careers as they worked to achieve the "American Dream" their family members established for them. All the hard work paid off is dedicated to all scholars of Immigrant parents, you did that.

Keywords: turning points, Latino students, family relationships, resilience

You Allow Them to Know as Much as You Want – An Undergraduate Latinx Perspective

The transition from high school to college can be challenging for undergraduate students, particularly for Latinx students who may face additional financial and academic barriers that exacerbate the disruptions they experience during their college journeys (Gonzalez Castro, 2023). Although these disruptions can make succeeding in college challenging, some Latino students are able to employ communicative processes that help them bounce back and overcome these disruptions. Thus, this study is guided by Buzzanell's (2010) communication theory of resilience (CTR) which describes five major resilience processes people can enact in times of difficult life transition. Through the support of family members and mentors, Latinx students who may initially feel underrepresented or lack access to full opportunities can employ resilience processes to overcome the challenges and barriers they experience during college. FGC students may work to navigate complementary and conflicting individual/personal and collective/family goals (Bui, [6]; Lee et al., [24]; Terenzini et al., [54]). Latinx students who are able to interact with family members and mentors who demonstrate an interest in their academic careers are able to see how they can add value and strength to their academic communities as they pursue their unique academic journeys (Wang, 2014). Strong parent-student relationships are especially important because education has the potential to affect the prospects of FGC students as well as the society they are a part of. (Wang, 2014). Maintaining communication within the relationship with parent-student will help create role models to continue pursuing their education.

Challenges Latinx Students Face

Latinx students face challenges and obstacles in various forms including financial barriers and stress about paying for college expenses (Gonzalez Castro, 2023). Latinx students often rely heavily on FASFA, scholarships, out-of-pocket spending, and financial support from

family (Kendra & Wachtendorf, 2003; Majchrzak et al., 2007; Treem et al., 2020). By maintaining contact with their children in their native countries, parents try to keep their memories alive and provide support to their children despite their physical absence in the daily lives of their children. Notwithstanding parents' attempts to relieve the stress upon their children due to their absence, children who are separated from their parents due to immigration are often susceptible to attachment difficulties, depression, decreased academic performance, and behavioral problems (Abrego, 2014; Artico, 2003; Lovato-Hermann, 2017). "Regardless of institutional type, these students have similar challenges or issues in their adjustment to college - - being aware of institutional resources, using their help-seeking behaviors and developing supportive relationships with faculty," Ponjuan said. (2021, June 4) Behavioral obstacles are a leading factor to division in academic advancement. Latinx students are likely to experience prejudice and discrimination as the targets of racial and gendered microaggressions. Smith (2023) The challenges Latinx students face go beyond financial barriers. They deal with stereotypes, microaggressions, and feeling of not belonging. Chicana/Latina college students continue to experience racial/ethnic and gendered isolation, academic and culture shock, feelings of imposter syndrome, and a lack of belonging at the university. Ramirez (2023) " I've definitely heard things, other people; maybe they get excluded from groups and stuff. "Miguel also reported hearing about others negative experiences regarding their race or ethnicity. Carlos and Miguel's reports of others' experiences are likely true, but may also be a part of the narrative they tell themselves to help better cope with any microaggressions they might face. Because microaggressions are ambiguous, they can be dismissed as behavior less egregious than direct discrimination, and therefore minimal (Sue et al., 2007).

How Supportive Relationships Help Latino Students Navigate Challenges

Supportive peer, family, and mentor relationships help Latinx students navigate the challenges they may experience during college (Ramirez, 2014; Wang, 2014). Ramirez (2014) discussed the positive impact of support networks that consist of on campus organizations that help students feel included in achievements. Through these on campus organization, faculty mentors can cultivate more direct and informative supportive relationships that help Latinx students overcome academic challenges they may experience. These on campus organizations also foster the creation of academic communities that allow Latinx students to flourish together with peers who come from a similar background. These supportive relationships also help Latino students navigate challenges, mitigate hostile and toxic environments, and decrease their stress. Wang (2014) reported that family members' memorable messages encouraged college students to continue their academic journeys. Wang (2014) argued that supportive relationships are crucial for Latino students both academically and emotionally, because students felt reaffirmed when they received support from their support network. Additionally, access to clubs and other such structures promoting positive ethnic identity through relationships with coethnic peers can act as a protective factor for immigrant students against discrimination, another significant stressor and barrier to positive adaptation for immigrant children (Silver, 2015).

Theoretical Framework: Communication Theory of Resilience (CTR)

Buzzanell ([11], [12], [13], [14]) articulated the communication theory of resilience (CTR) as a frame for examining how individuals craft new normals through talk after disruptive life events. There are several communicative processes involved. These include: (a) crafting

normalcy, (b) affirming identity anchors, (c) maintaining and using communication networks, (d) putting alternative logics to work, and (e) downplaying negative feelings while foregrounding positive emotions, such as hopefulness and self-efficacy. definition of resilience as ''the process of reintegrating from disruptions in life'' (p. 309, emphasis added; see also Curtis & Cicchetti, 2003). part of the issue is figuring out what resilience looks like in different contexts, how the processes unfold, and how we can envision resilience as a design aspect rather than mistaking the entity or person for the process (e.g., focusing on a resilient person rather than looking at resilience per se; for leadership as a design aspect, see Kelly, 2008). Crafting Normalcy for Latinx Students was lead with the passion to have a better lifestyle. Undergraduate students expressed the desire to defeat the stereotypes of emotional distress. Students shared the desire to achieve academic success to achieve normalcy accepts of sufficiency in the family role. I define identity anchor as a relatively enduring cluster of identity discourses upon which individuals and their familial, collegial, and/or community members rely when explaining who they are for themselves and in relation to each other. (Buzzanell, 2010). Participants shared the disrespect and uncomforting feeling they felt in regards to individuals attaching to their success. Buzzanell introduces the usage of communication networks to remain at a maintaining level. Joining organizational settings switches the transition for students.

Research Question

RQ: What types of turning points do Latinx undergraduate students experience during college?

Method

Turning Points Design

Employing a turning points research design allows researchers to learn more about events

that are significant to individuals. Researchers have used this design in several different communication contexts including organizational communication, interpersonal communication, family communication, gender communication, instructional communication, and intercultural communication. The current study builds upon what is already known about turning points in family communication and instructional communication by focusing on turning point events that Latino/x students experience during their years in college.

Qualitative Interview Design

This research study used a qualitative interview design to highlight the participants' turning points from their point of view. This methodological approach allows participants to share the stories and turning point events that have built and constructed their academic paths and allows the researcher to cultivate a space to craft conversational interaction while collecting rich data.

Participants

The current study included participants who were undergraduate students who were 18 years or older and identified as Latino/x. Demographic questions focused on age, gender, ethnicity, major/classification, and family background. Interview questions focused on what made interviewees continue to pursue their education, how and what their family support system contributed and consisted of, and the description/relationship of the family dynamic. Interview questions included: How would you describe your relationship with your family? How would you describe your family's perspective on success when it comes to your academic career? Share a story about an event/experience that shaped how you perceived your academic success.

Data Collection

Following Institutional Review Board approval, interviews were conducted via Zoom,

phone, and in person using the interviewee's preferred modality. Interviews lasted between 25 to 55 minutes averaging 33 minutes. The 15 interviews resulted in 202 pages of transcriptions. Interviews varied in length based on how participants interacted with families about their education. Participants shared moments where they perceived their education as an academic success and who was present to support them. At the beginning of the interview, I asked participants to provide demographic information including age, gender, major/classification, and family background. Participants ranged in age from 18-25. Most participants were in there early 20s. There were 10 male participants, 3 female participants, and 2 participants who identified as other. There were 2 freshmen, 4 sophomores, 3 juniors, and 6 seniors. I also asked participants to rate the level of support system coming from their family from 1-10. Their support level average was 7.

Data Analysis

The objective of the study was to identify turning points themes that occurred during Latino/x students' college experiences. Using each turning point as a unit of analysis, I used Smith's (1995) guidelines for a qualitative thematic analysis reading the transcripts twice: first to gain a holistic perspective and second to note emerging turning points themes. I took detailed notes by creating an audit trail that allowed me to select exemplars (Lincoln & Guba, 1985) and create a list of themes using Owen's (1984) three criteria of recurrence, repetition, and forcefulness. As I read through the transcripts, I categorized the turning points beginning with the first turning point. This turning point comprised an initial theme. After I created the initial theme, I created a label that captured this theme. Starting with the second turning point and continuing with all remaining turning points, I compared each turning point to the existing theme. When a turning point was similar to an existing theme, I grouped it with that theme. When a

turning point was different from all existing themes, I created a new theme. After I reached

theoretical saturation at the eighth interview, I produced an initial list of turning point themes. I

then refined the themes, clustering similar themes as needed, and identified what sub themes

emerged from each theme. After I finalized the list of themes and sub themes, I paired each sub

theme with an exemplar statement (Corbin & Strauss, 2008) and compared my turning points

themes to the existing literature.

Data Validation

To validate the data, I used six common validation strategies. First, I recorded and

transcribed the data. Second, I continued interviewing and analyzing data beyond theoretical

saturation. Third, I kept an audit trail. Fourth, I participated in an interactive data conference with

two researchers who were familiar with the content and method used in this study. Fifth, I

engaged in member checking by sharing a list of preliminary themes and exemplars with all 15

participants to check whether the findings reflected their experiences (Creswell, 2007). Eight

participants responded and agreed with the themes I identified. Thus, further edits to the themes

were not necessary. Finally, I used detailed participant quotes throughout the manuscript.

Results

Through my qualitative thematic analysis, I identified three turning point themes. These

turning points focused on (a) motive, (b) support, and (c) goal acquisition. At least one of these

themes, and usually multiple themes, were identified in all 15 interviews. Each theme is

discussed in turn.

Motive

The first turning point theme focused on initial conversations with undergraduate Latino

students. They recalled events and/or experiences that helped them perceive their academic

success. Several interviewees noted that these turning points involved chasing the "American Dream". The interviewees discussed their parents' sacrifices to achieve their goals of helping their children have a better future and education. Motive turning points included turning point sub-themes that involved (a) fear of failure and (b) fear of unfulfilled obligations.

Fear of Failure

Participants were quick to share that their first turning point after graduating high school consisted of conversations focused on how they would continue their education. Family members conversations focused on sharing the need to obtain a degree to have success. During the initial conversation, family members clarified that education was the primary tool for a better lifestyle. Participants noted that family members were often persistent but sharing those same goals and aspirations involved discussing concerns. For example, Emily said, "Well, I just really wanted to make my parents proud of, you know, I felt like not going would be kind of a disappointment."

Participants wanted better for themselves and learned how to manage their educational path. The motive to keep a functional lifestyle came from that fear of failing. Participants wanted to remain in good academic standing in college. Martha's turning point captures this theme:

> I would say long nights. Um, many events. So like sometimes it's overwhelming having classes, um, practice and then hitting the books and I feel like there's definitely times where I'm mentally like unwell just because I can't balance it all. Um, 'cause I also do work, so it's just a lot to keep track of and I feel like sometimes I do lose sight of what I want in a way, although that it is it, like they do set high expectations, but I always wanna meet them, so it's challenging.

Latinx students like Martha experienced a fear of failure to meet their daily expectations. This

often made finding stability challenging. On the other hand, participants knew that their desired lifestyle depended on their decisions. Participants like Diana shared that they were able to progress and better themselves over time:

> I'm the type of child that is a suck-up to the parents and at the end of the day, I'm not doing it for [my parent], you know, or doing it for myself and just growing up, just my parents always telling me and it's just that fear. It's just fear. That's what it's fear that they put in me. Like if you don't go to school, you like, they tell me all these different, um, outcomes that could be like bad outcomes. Like yeah, you don't go to education, you're gonna be stuck working that eight-hour shift day, like minimum wage, this and that. Like you, you're gonna want that life known like this and that in a fearful way. They don't, they don't tell me in like a positive way if you know what I mean.

Latinx students like Diana pointed out the negative tensions they experienced trying to meet their family's expectations. They described the academic journey to be discouraging as they attempted not to fail and expressed fears of being a failure. Diana continued:

> Um, sometimes makes me feel like, um, not good enough. Whatever I do, I'm not good enough. They make me think if I go to school, they're not even happy supporting me and I just work like they, my mom be like, yeah just, but you need to go back to school. You know, it's like there's no win, there's no, it's just, it's like never enough for them. And now that has impacted my life because I think about that all the time and what they, I dunno, it's just everything I do, I'm just like, well, it's not even, they always have something to say. Something else to say.

Fear of Unfulfilled Obligations

The second sub-theme focused on Latinx students' fears that they would not be able to

fulfill the obligations their parents expected from them. These fears often spurred participants to continue their family's tradition of working hard to achieve their goals. Participants felt encouraged to overcome any obstacles they faced to gain a better social status. Latinx students like Melissa pursued their college degrees to honor their parents' sacrifices:

> I think, obviously everyone says this, but it's like the basic like, you know, immigrant parents that they want you to do like everything just because they hold the, like, I came to this place with, um, abundance opportunities and, you know, you have to take advantage of that, all that stuff.

The "American Dream" from the perspective of undergraduate Latinos, is having a profession. In return for all the hard work that was established by their parents, participants fearer that they would fail to meet these obligations. Since childhood, parents expected their children to succeed. Mathew's turning point captures this theme:

> Yeah, so I know, uh, basically all my life, my parents have always told me to go to college, do better than what they did. So, um, experiencing what they would do 'cause I would sometimes go to work with my dad and just see what he goes through. Um, he came from Mexico, so he has very limited resources and everything around here. So it made me realize that, you know, being able to grow up and be the first one in my family to graduate high school and just knowing that there is a different way to be successful in life kind of was the driver in making me push myself to be hard and like all my academics and things like that. So, um, knowing that I wanna do better than my parents and the fact that they kind of raised me to do that, um, kind of helped, made me wanna stay in education.

The participants shared that fear of unfulfilled obligations came from the struggle for a stable

income. In addition to earning a stable income, Latinx students also wanted to feel satisfied with their lives. Mark's turning point echoes this idea:

> You know? And it's also, yeah. The idea that of the American dream as well. You know, I have all these opportunities pre, uh, afforded and presented to me as a US citizen that the rest of my undocumented family doesn't have. You know? And I, I guess it's pushed onto, uh, our first, the first generation Americans that you need to take advantage of this. You know, if you don't take advantage of this, you're kind of selfish and stuff like that. But I take it as a positive, as in like, yeah, these are, and I'm going to take advantage of it because this is a privilege.

Participants adapted by expressing gratitude as they completed steps in their academic journey. Despite these accomplishments, some Latinx students like Isabella still expressed some fear:

> Um, I guess it's always been like, um, like placed in, like growing up it's like, oh, if you don't go to like, fear of like, you'll become like them. I don't know if that makes sense. Yeah. No, no. It's like, so, um, it's always been like, if you don't do this, you're gonna be cleaning bathrooms. Like me. If you don't do this, you're gonna be doing that. Mm-Hmm. So I guess the first drive wasn't really passionate. It was more of like, oh, I can't, I can't do that. So it's, I guess it's fear. Mm-Hmm. Honestly, fear.

Support

The second turning point theme emerged as participants began their journey through college. Latinx students noted that the journey was challenging. However, they were able to find educational support from different groups. These connections helped them receive the support they needed to continue prioritizing their education. This support came in the forms of (a) network support, (b) financial support, and (c) emotional support.

Network Support

Throughout the interviews, participants stated that support from interpersonal relationships was rewarding. Latinx students sought academic success as they saw people in their network accomplish the goals they set for themselves. Supportive friends and faculty members helped Latinx students better understand went on inside classrooms and encouraged them to continue to attain educational milestones. Tania shares a turning point that echoes this idea:

> I would say like my friend group. Um, because when you surround yourself with like, people who also have like the same goals, like it makes you want to like also work hard too. So when I see like my friend, you know, they're studying, they're doing this, they're doing that, like, it makes me also wanna do that and like, keep me on my toes. So I feel like that's what helps me.

Participants noted that network support helped make educational challenges more realistic and manageable. Latinx students were better able to reach opportunities, because their network kept them motivated to succeed. Participants like Zuri shared that academic mentors were an integral part of their support networks:

> Yeah, [my McNair Director]. Love her. Yeah. Like, I've known her since I was in high school, and she's just always been there for me. And I'm like the things that I, I feel like the things I couldn't talk about with my parents, I was more freely able to talk about with her. And she always just gave me a point of wisdom. Um, and like, just in general, like I, it is through those opportunities that I went through and stuff like that that makes me wanna keep studying so that I can like be another picture for basically, I dunno if that makes sense. But Yeah. Um, they just, yeah, A lot of motivation came from that. Um, apart from my parents obviously, but yeah.

Financial Support

A second sub-theme involved finding the necessary financial support needed to pay for the college degree needed to achieve the "American Dream". Participants noted that having financial support from family was uncertain. Participants had to balance long work hours with educational tasks. However, any support from FASFA was appreciated. To continue receiving financial support, participants had to succeed academically. Latinx students like Adrian were also stressed about how they would pay off educational debts post graduation.

> I mean, yes and no in a sense. Um, like I never had to ask my parents for money, at least not, not for school, right? Like I, but uh, like I've been working since I graduated high school and I also have a scholarship secured. So I, they never had to pay for school and that's like the goal, right? Um, but like, I didn't wanna put that pressure on them because I know they ain't like when they had to pay for my sister's stuff and I just don't want them to pay for my things because they're already busy, they're doing things, they got their stuff going on, I pay.

> Participants shared that even after they received scholarships the uncertainty of whether or not they would continue receiving consistent financial support continued to linger in their mind. Latinx students like Isabella were cautious about asking for financial help from parents to avoid increasing their parents' stress levels.

> I got the scholarship. Um, you know, I'm living here now. I think even now is that uncertainty of like, I can't do this. I can't do that. I can't fail. I can't do this. Um, it's money. It's always money. So, um, I pay for my own, you know, my car, my mom gave me my car. It, it was her old car, so she had already paid it off. But I paid, you know, gas, everything followed, um, my own things, food when I go out. Um, so it's always been

money. Um, that's my biggest like uncertainty.

When participants identified a need for financial support, their family members were there to support them. However, Latinx students like Melissa often wondered what they would need to do in exchange for receiving financial support.

> I think it's important to find community in everything that you do. So like the gym, your job, your house, like your friends, your roommates, you know, your family. I think that my family definitely helped me a lot financially. Like my mom, I can always rely on her and, you know, as like, I think it's like she doesn't, she doesn't bother to like, give me money. She's not like, you know, gonna hold it over me. Mm-Hmm because I've had that done before, but I think now it's more so like, I'm just trying to help you and like, but like, it's just been ingrained in me, um, since I was young that you're gonna hold this over me and you're gonna make me feel bad later. So I don't really wanna ask for money now, you know?

Participants felt that they needed to provide a list of reasons to ask for financial support from their family members. Rather than asking for financial support, they relied on themselves to address any financial problems. In contrast, participants were more satisfied with receiving emotional support when it was offered.

Emotional Support

The third sub-theme focused on the idea of having emotional support. Participants who had others validate their emotions were more open to deepening their connections with others. Latinx students shared that encouragement from family members was sufficient, but seemed reluctant at times. For example, Adrian said, "I tell my mom, oh, I'm not doing good in school. She responded by like I do anything <laugh> anything to be in your position. Like that, that

doesn't make it better. Um, um, for me it's hard." Barriers were created when the "hard work" from the perspective of participants was diminished. In instances like this one, the emotional support failed to validate their feelings. Participants struggled to find validation in parental support. This led many participants to feel isolated causing them to isolate themselves to avoid negative tensions. Emily's experience reinforces this idea:

> Uh, they encouraged me. I mean, I wouldn't say much because I felt like I was so focused myself in it, if that makes sense. Like, I wouldn't really tell them much about it. I guess they would just see me studying in my room and would always like, check up on me and make sure I was okay. And I would, I really, I would just keep my studying to myself in my room, but they would help me.

Participants often did not know how to approach the emotional aspect of life with family members. This caused Latinx students like Nancy to distance themselves from their family members and disconnect from their cultural roots.

> Um, I don't, it's, I guess it's impacted it a little bit maybe, um, because I just don't, sometimes I don't even bother telling 'em just because I feel like it's not easier, but it's, they wouldn't understand without saying that in like a harshly way. Um, but they just, and it's not like they don't care, but it's harder for me to explain something to them, I guess. And there's also, um, unfortunately now a like language barrier around, I'm forgetting, you know, some words. So it's like, I don't even know how to describe it to them, so it's like a little bit harder. But, um, I don't know.

Participants made it clear that it was not disinterest from family members that made it challenging to form the connections needed to understand their academic achievements. Instead, most participants were aiming to reach goals their family members were unable to fulfill for

themselves. It all became part of the process of reaching that "American Dream".

Goal Acquisition

The final turning point theme was experienced by the participants as they reached the end of their educational journeys. Latinx students shared that having control of their outcome was a turning point, because developing new beginnings was a product of their hard work. Participants realized that to feel fully satisfied, they could need to rely on themselves. In most cases, this offered the new idea of investing in themselves by focusing on (a) independence, (b) health goals, and (c)relationship goals.

Independence

The first sub-theme focused on how participants overcame challenges to acquire their goals. Overall, participants like Nancy who were able to achieve levels of independence were able to navigate the early stages of their educational goals.

> Um, I think it's made me more independent. Um, just like I said, just 'cause I've never really had, I've had the emotional support, but like, um, even if they would wanna help me, they just couldn't, um, because they didn't understand it. So definitely more independent and trying to go, um, try to figure out things by myself, you know? And it's now, it's kind of hard because, um, I know now that I don't have to do everything myself, you know, I can ask for help, but, you know, as a, I guess as a young adult, it's definitely made me more independent and trying to go out and do things, I guess.

Participants shared that throughout their academic journey having to walk alone in the process helped them increase their independence. Latinx students like Karen were inspired to make their own life choices:

> Um, as someone that has like grown up in the Hispanic household, regardless of your

situation, if it's like a toxic household, they just don't understand at the end of the day, you live your own life, right? So not saying do what you want but I would say just do what you think is the right decision and at the end of the day you'll get what you, what you need to be because everybody has a plan in life. You know, everybody has a purpose. And even though my purpose was, my purpose is here in the Marine Corps right now, obviously, but my purpose is also like pursuing my education regardless of how, like regardless if it's like one year, two years, whatever, whatever a year late, maybe when I was about few months late, but at end of the day you're still gonna get your degree or whatever you're studying, you know what I mean?

Health Goals

The second sub-theme dealt with the physical and mental health of participants. Participants shared that when they prioritized their health, they were more at ease. As they dealt with mental health issues, Latinx students like Mathew often increased their communication with family members.

> So I personally like to keep, I really only like to say I have like maybe a few close friends and then my family and that's it. Um, and I rely on them a lot. Uh, and I know they rely on me a lot as well. Um, I am really open and personal with them about how I'm feeling and it really didn't start happening until I realized my personal health issues that I started to become more open with them about that. So that kind of helped. And I feel like it kind of helped make it more of an open space to where we, you know, it's a two-way type of relationship where, you know, if they have a concern, you know, similar type of, because I know specifically health and weight and things like that are sometimes sensitive topics for some people. Yeah, so I feel like being able to open up in that capacity makes it more

of a safe space, which kind of helped grow that support system in a way because we're all kind of going through similar things, if that makes sense. So, I dunno, that just kind of helped in a way, if that makes sense.

Other participants shared that their family members prioritized their education over their mental health. When this occurred, Latinx students like Zuri sought out other ways to prioritize their mental health beyond communicating with their family members.

Yeah, like I still feel like I'm off the mark on, on like responding, but recently I, I started attending therapy sessions and like my parents really against that, they're, they don't believe that mental health is a thing. And so like, uh, I had to stop because it, I was, it was getting too expensive and I, I couldn't keep going. So I was like, but um, during the time that I did go, I realized that there was a lot of things that I just had been holding in that I didn't know. And like, things that I had, like, I, it was, it was through that therapy that I realized that I just didn't cope in high school. Like I didn't, or in general in school, I didn't never gave myself time to really think or anything. Um, and now that I was given those opportunities, I'm like, oh, wow, there's a lot of things I gotta work out actually now that I have more time for myself. Yeah. Um, and I know that, and I like, it's not that I'm negatively talking about my parents either, but I know that if I was still living at home, I wouldn't have been given a chance to like, go find out for myself. Like what these, what I'm feeling is.

Relationship Goals

The final sub-theme showed how participants varied in the extent to which they communicated with others during different parts of their college journeys. Some participants like Mark shared that their relationships with their friends, network, and family members became

closer when they were open in what they shared with others.

> I am such a mama's boy and everything like that. And I'm, and I'm proud to say that because not everybody has this very intimate relationship with their parents, you know? You know, for a lot of people, a child is an 18-year commitment, you know? But I can talk to my mom about my relationships. I can talk to my mom about my finances, whether she decides to help me or not. I can talk to my mom about, you know, very intimate subjects like my sex life. You know, the certain things that are going on medically and everything. And she always has something positive to say. I mean, she'll relate to me a little bit because she's my mom.

Mark's close relationship with his mother allowed him to achieve his relationship goals. For other participants like Mathew, the journey to make a closer connection within their relationship was more challenging.

> So I would want to try to spend time with everyone as much as possible. Um, but it's really difficult because they all don't see it that way because they're constantly around each other all the time. Which again, I get, but whenever I come home, I don't get to see any of them. So whenever one person's here, one person's in their room, one person's over somewhere else and they're all watching TV or doing their own separate things; it's just frustrating and difficult because, um, I know like my time at home is limited, so my time being able to spend with my family is limited, but I also don't want to miss out on the crucial moments and things.

As participants learned more about how to communicate with their family members successfully, they were able to fulfill their relationship goals and share the "American Dream" with their family members. As they shared the "American Dream", Latinx students realized they were

achieving not just their own dreams but their family members' collective dreams as well.

Discussion

The present study highlighted the challenges Latinx students experienced as they navigated their college experience. Similar to Gonzalez Castro's (2023) study, Latinx students in this study often relied on their support networks to manage the challenges they experience during college. Participants noted that mentors and professors were meaningful sources of support. Creating these connections opened doors to new opportunities for Latinx students.

Although the study provides valuable insight about Latinx students' college experiences, there are some limitations. The first limitation is sample size. Although I reached theoretical saturation, increasing the sample size could provide additional nuances to the existing themes and subthemes. Future research that includes a larger sample size may deliver richer data.

Future research could also explore the role of bilingual education access and its potential to provide support and improve student opportunities. Participants shared that language barriers were challenging for them. Perhaps having more access to both English and Spanish languages could provide additional support.

In conclusion, Latinx students possessed determination to succeed in their education goals. They demonstrated resilience in wanting better not only for themselves but for their family members. They were able to transform negative tensions into positive turning points that supported their academic pathways. This highlights the strengths that makes the "American Dream" manageable emphasizing the idea that everything comes at its time (todo a su tiempo).

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The Present Trade Relationship Between El Salvador and The United States and Future

Projections of Growth Between the Two Countries

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Abstract:

After the reelection of President Nayib Bukele, many eyes are on the smallest country in Central America, El Salvador. With the complete turning of one of the most violent and poorest countries in the world to one of the safest countries in Latin America as of today, many expectations come for the rise of El Salvador's economy. This research will cover the historical and trend analysis throughout El Salvador's civil war effects through the 90s and the impact of a "weakened government' against gang power in the following years, as well as look into the future projections of El Salvador's economy up until 2029. As such, little research has explored the projected growth of El Salvador's economy. The results show a rise in the country's Gross Domestic Product in the next five years, thus meaning a surplus in El Salvador's international trade. El Salvador's GDP growth is significant for El Salvador and the United States because it is its leading trade partner, valued at almost 7.9 billion U.S. dollars in 2022. This research will show export and import trends between the United States and El Salvador. Understanding both countries' historical and trade relationships could open interest in investing in Salvadoran industries and further research and projections on the countries in the Dominican Republic-Central America Free Trade Agreement.

Introduction:

The improving economy in El Salvador, the rise of President Nayib Bukele, and the emergence of the new political party, New Ideas (Nuevas Ideas), are raising expectations for the future of El Salvador. Many are particularly interested in the changes in the country's international trade. This research will examine the general trade relationship between El Salvador and the United

States over the years. It will also dive into the political and socio-cultural dynamics between the two countries throughout the Salvadorian Civil War, Latin America's "lost decade," up to El Salvador's current economic state. The paper touches base on the Dominican Republic-Central America Free Trade Agreement (CAFTA-DR) with the United States and the future course of action that can be done to increase trade, specifically in the textiles and apparel industry in El Salvador, which is the country's main exported product. The objective of this research is to understand El Salvador's economic and political position throughout its history, analyze its trade patterns with the United States, and make future projections up to 2029.

Literature review:

In 1979, El Salvador was facing a civil war between the Farabundo Marti National Liberation Front (FMLN), a left-wing organization backed by Cuba and the Soviet Union, and the Salvadoran government. Throughout the war, the FMLN strategic attacks were to destroy state-owned infrastructures, and the Salvadoran government responded by massacring the Salvadoran population, thus eliminating their working population (Pedersen, 2002). The war created an economic setback with significant implications across the country. With this, the Regan administration increased aid to the Salvadoran government, and mass migration of Salvadorans entered the United States seeking refuge. Salvadorans in the United States took on high labor jobs with men most commonly finding work in construction and women finding jobs in domestic services (Repak, 1995; Pedersen, 2002). Many who came to the United States would work to send money to their families back home, thus creating an increasing inflow of U.S. dollars to El Salvador. This was now El Salvador's new relationship with the United States through migration, "cut-rate labor power," and remittances (Pedersen, 2002). Up to the Salvadoran Civil War, El Salvador's main exportation to the United States was coffee and cotton in return for

manufactured goods from the United States. The addition to this new "export," being the "Salvadorean capacity to work," benefited the United States in the building of metropolitan cities as well as for El Salvador's economy, with money being sent back to families, boosting the struggling financial state (Pedersen, 2002).

While tension is at an all-time high in El Salvador throughout the 1980s, Latin America is going through a period named the "lost decade." The cause of this issue was that during the early 1970s, many U.S. banks loaned money to Latin American counties with near-zero real rates of interest to short term loans. By the end of the 1970s, the United States was tightening its monetary policy, and with this, banks began to increase interest and shorten pay periods in Latin America (Federal Reserve History, 2013). Through this time, many countries were going through a recession and unable to pay their foreign debt to US banks, thus resulting in banks pulling away funds and loans from Latin America all while the United States was "hardening the US dollar". Following into the 1990's, Latin America rose from its decade of recession and El Salvador's civil war was ending. On June 12, 1991, a state visit was made by former president of El Salvador, President Alfredo Cristiani Buckard, to meet with President George H. W. Bush. In this meeting, President Bush remarked, "When you freed exchange rates, wiped out price controls and clamped down on government spending, your farmers, your workers, your investors responded with a burst of creativity and growth. Inflation fell last year, and exports rose by 17% And, in spite of guerrilla attacks on economic targets, your economy grew faster than it has since 1978- up 3.4%". With this President Bush takes high regard towards President Cristiani Buckard and the Salvadoran government to regain governmental power. President Bush called for peace stating, "Throughout your country and the world, people of good will agree that time for peace has come". During this time the United States was moving forward with developing framework

agreements with countries who desire to work towards freer trade with the United States. Countries at the time that had already signed were Argentina, Brazil, Paraguay, and Uruguay.

In January 1992, El Salvador signed a path to peace in Mexico City's Chapultepec Castle, making the Salvadoran Civil War come to an end. In 1997, the World Banked released a report on El Salvador's economy, highlighting the improvements the country had gone through the past decade and for "meeting the challenges of globalization" (Pedersen, 2002). In this report the World Bank stated that the country had two kinds of economical inflows: capital and remittances. Through this report the World Bank "congratulates" El Salvador for its transformation and the country's economic management. By 2001, El Salvador's currency was changed from the colón, named after Christopher Columbus, to the US dollar, allowing the currency to circulate with the current Salvadoran colón (Pedersen, 2002).

Jumping over to 2016, El Salvador is stated to be the most violent country in the Western Hemisphere. At this point in El Salvador, crime is at an all-time high, with more than 6,640 murders at the end of 2015 (Daugherty, 2016). With gang violence erupting every day between El Salvador's two largest gang groups, the Mara Salvatrucha (MS13) and Barrio 18, both gangs developed in Los Angeles and later spread to El Salvador and surrounding countries.

In February 2019, the streets were filled with people celebrating the election of current President Nayib Bukele. With this election, President Bukele made history in El Salvador after winning against the two leading political parties in the country. The two dominate political parties in the country for decades were FMLN and the Nationalist Republican Alliance (ARENA). At this point, El Salvador needed change, and New Ideas gave that sense of change. Many political and economic pundits indicate that the importance of President Nayib Bukele's victory in the 2019 elections was because of the citizens' movement and that, unlike other Latin American countries,

El Salvador was not looking for a left-winged movement but rather grew "fatigued against the conservatism of ARENA and the bad government of the former FMLN guerilla organization" (Delgado, 2022). In the next few years, President Bukele would turn over the high crime state to currently being one of the safest countries in Latin America, using his method, "Mano Dura," meaning firm hand. With his reelection, President Bukele's promises to maintain El Salvador's safety, tackle poverty rates in the country, and improve its economy. El Salvador's largest export industry is textiles and apparel, specifically knitted clothing, with the United States being El Salvador's leading trading partner in exportation and importations as of 2022 (Statista, 2024). This being El Salvador's most significant manufacturing product, many women workers are the primary earners across the country (The World Bank, 2020; McAndrews & Ha-Brookshire, 2022). For the Salvadoran economy to improve, the focus should be on human capacity development; if not, the nation will "lack ability' to progress (McAndrews & Ha-Brookshire, 2022).

Methods:

The methodology used in this research was a comparative analysis between a historical and trend analysis. The research is based on examining how the trade relationship has evolved over time in response to changes in political, economic, and global contexts. With that, the trend analysis was compared to the use of historical trade data to identify trends that might continue or change under future conditions.'

Results:

According to Statista, El Salvador's GDP is predicted to increase by +25.47% between 2024 and 2029. In total of 9 billion USD. In 2029, El Salvador's GDP is estimated to reach 44.33

billion USD. Thus, being a new peak in the country's history. An increase in El Salvador's GDP

can be a sign that the country's economy is and will do well. With this increase, we can see a

peek into the future and see that employment will rise, businesses will expand and invest, thus

meaning there will be a surplus in international trade. With this projection we can discuss the

future expected on El Salvador's political stance. As the political party, New Ideas (Nuevas

Ideas) continues to be the public's loyal vote, many see this as a bright outcome for their

economy and the country's well-being. See Figure 1 below.

Figure 1

Gross domestic product (GDP) in current prices in El Salvador from 2009 to 2029 (in billion U.S. dollars)
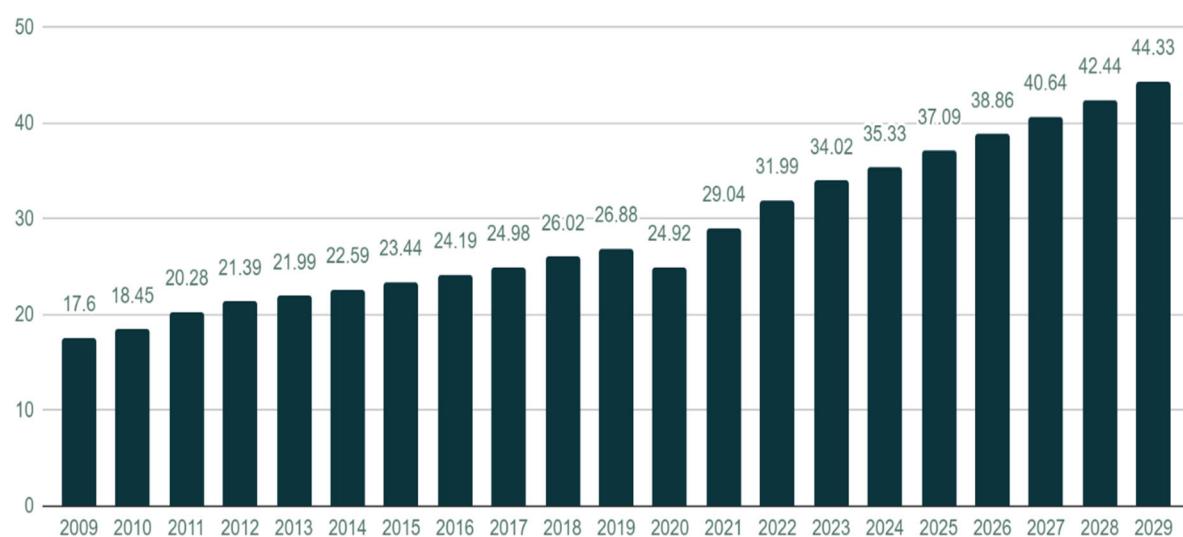
As of 2022, El Salvador's major five leading trading partners by trading value were the United

States, Guatemala, China, Honduras, and Mexico. In Figure 2 we are able to see the value of

imports and exports in millions of USD. The trade value of El Salvador with the United States

has reached almost 7.9 million, 2.79 million going into exports and 5.10 million going into

imports. Guatemala is second at a trade value of 2.9 million USD, with imports of 1.69 million

and exports of 1.23 million USD. The comparison between the two major trading partners is significant with a difference in an estimated amount of 5 million USD in the year 2022. As seen in Figure 2, although El Salvador is part of the Dominican Republic-Central American Free Trade Alliance, their five major trading partners from the CAFTA- DR only include Guatemala and Honduras. See Figure 2 below.

Figure 2

Leading trading partners of El Salvador in 2022, by total trading value (in million U.S. dollars)

Figure 3 shows the leading imports in El Salvador. A significant product imported would be petroleum or bituminous mineral oils, not including crude oils. The total value of these oils is over 2.1 billion USD, and the second leading trade is petroleum gas and other gaseous hydrocarbons, with a value of around 525 million USD, mostly coming from the United States.

Figure 3

Main imported products in El Salvador in 2022, by value (in million U.S. dollars)

Product	Value
Petroleum or bituminous mineral oils, except crude oils	2,129.50
Petroleum gas and other gaseous hydrocarbons	525.60
Medications	476.60
Telephones, mobile cellphones and other wireless network devices	371.20
Passenger cars and other vehicles for the transportations of people	329.70
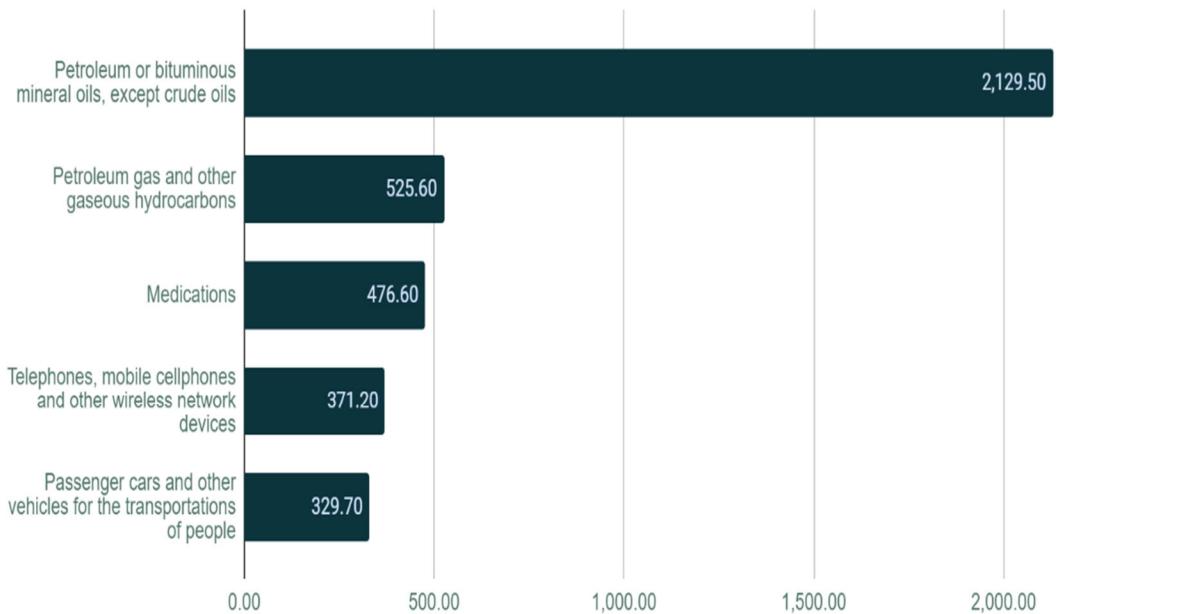
Figure 4 shows the six major exporting goods El Salvador has produced in 2022. Historically El Salvador was an agricultural exporting country but throughout the years it became industrial, producing and exporting millions of USD in textiles. Specifically, its main export being knitted sweaters, pullovers, vests and similar knitted products at a value of 365.6 million USD. Its main exports during its agricultural era were coffee beans and similar coffee substitutes as well as cotton but now that section ranks 6th in its major exports coming in at a value of 177 million USD. As well as the leading imported country, the United States is EL Salvador's leading consumer of knitted textiles.

Figure 4

Main exported products in El Salvador in 2022, by value (in million U.S. dollars)

Product	Value
Knitted sweaters, pullovers, vests, and similar knitted products	365.6
Knitted (t-)shirts	319.8
Transport and packing articles made of plastic, including lids and other closing devices	288.4
Cane or beet sugar and chemically pure sucrose	229.3
Toilet paper and similar paper types used for household or sanitary purposes	210.8
Coffee, roasted or decaffeinated, and coffee substitutes	177
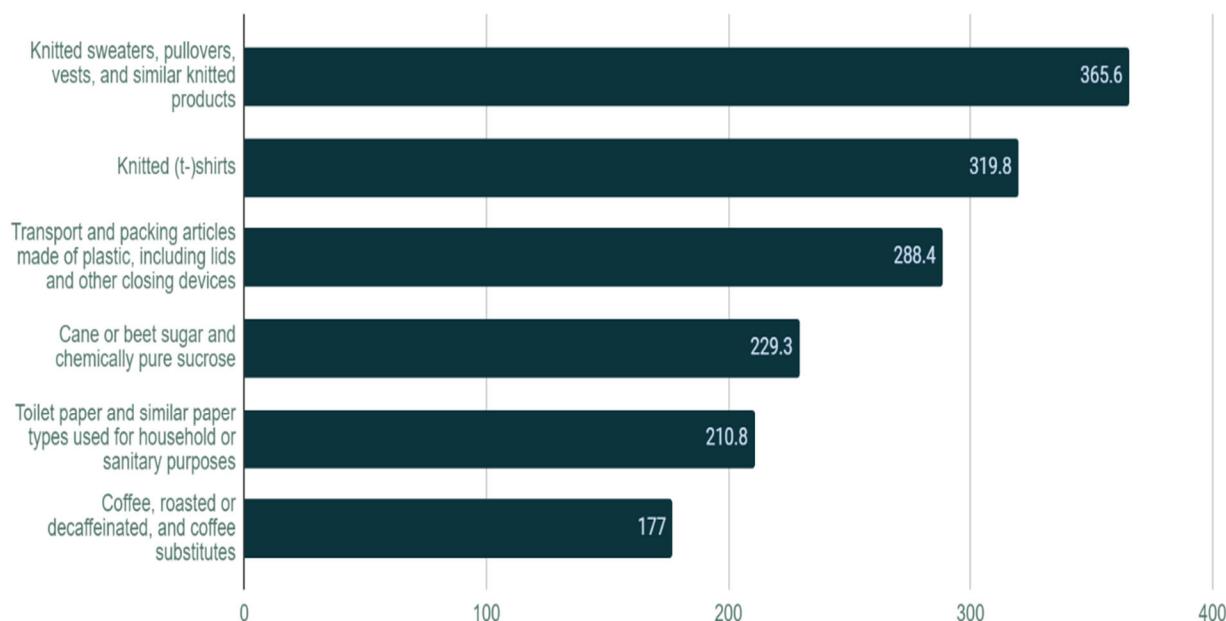
Discussions:

Much of the original topic overlapped with cultural anthropology as well as with political relationships. As the Salvadoran government changes, so does their economy. After viewing the patterns from 2009-2023, trends show a broad economic change in El Salvador. The country has gone from being perceived as one of the most violent countries in the Western Hemisphere in 2016 to one of the safest countries in Latin America in 2023. Further research could further show in depth the relationship trend between both countries and focus on a specific point in history.

Conclusion:

After analyzing and understanding El Salvador's relationship with the United States, the trends show the progression El Salvador will make in the next five years. With this we can see positive progression and opportunity to focus international trade towards El Salvador. In future research,

data will be available to see President Bukele's first year into reelection to see the methods and plans to combat unemployment in El Salvador as well as how accurate the future projections of their GDP as of year 2025. With the start of President Nayib Bukele's second term, political, social, and economic policy observers will be able to see if President Bukele will implement a similar strategy as the "Mano Dura". El Salvador will thrive in the next few years if the focus shifts to the Salvadoran youth and education. Infrastructure, poverty, and unemployment are critical factors in this five-year term. Looking further into CAFTA=DR on how the United States plays a role in trade with the rest of the neighboring countries and are the countries future projections any similar to El Salvador's increasing GDP.

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A Six-week Plyometric Training Intervention Improves Jump Performance in Trained Cyclists

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Abstract

INTRODUCTION: Collegiate Cycling has increased in popularity over the years. Plyometric training is a popular training program that utilizes jump training and explosive movements to increase force production, jump height, and sprint ability. There is currently a lack of research on plyometric training in trained cyclists. This research's purpose was to assess the effects of a six-week plyometric training program on jumping ability and maximal oxygen consumption (VO2max) in young, experienced cyclists. METHODS: Nine healthy collegiate cyclists seven men and two females, participated in the study. The participants came to three visits at the University of Montevallo Performance Lab. These visits included assessments of anthropometrics, including body fat percentage, jump heights of the following jumps: countermovement, static, drop, and VO2 max was assessed on a cycle ergometer using indirect calorimetry. Participants completed pre-testing (time point 1), six weeks without plyometric training, mid-testing (time point 2), then six weeks with plyometric training, followed by post-testing (time point 3). RESULTS: The results indicated a significant increase in the countermovement jump height ($p = 0.032$) and the static jump height was trending improvement ($p = 0.06$) from time points two to three. However, the VO2 max did not change ($p = 0.54$). CONCLUSION: Plyometric training significantly improved jump height in collegiate cyclists over a six-week period, exhibiting its potential to enhance lower limb strength and tendon stiffness.

Introduction

Training should include strategies and specific components to optimize an athlete's potential in their sport. Plyometrics is a well-known form of training that focuses on primarily increasing speed, power, and agility. In the context of cycling, particularly amongst Division II cyclists, plyometrics training presents a different approach to their traditional training methods. The primary focus of cyclist training revolves around endurance and aerobic capacity and the addition of plyometric training provides an improvement of an athlete's power and muscular strength. Plyometrics is intended to increase power by using the elastic components of the tendon, muscles, and stretch reflex (Sakaret.et al 2014.) This study aimed to explore the specific effects of plyometric exercises on Division II cyclists, shedding light on how these high-intensity movements could contribute to the improvement of cyclist performance.

Plyometric exercises fulfill this requirement by providing significant gains in muscular power in a short duration (Cormie et.al, 2010). Cycling performance relies heavily on the ability to generate and sustain power output, especially during sprinting, climbing, and accelerating phases. Research suggests that plyometric training can lead to improvements in muscular strength, which is crucial for achieving higher power outputs during these critical phases of cycling (Markovic & Mikulic, 2010). Also, the inclusion of plyometrics could lead to better force production during pedal strokes, enhancing both cycling efficiency and race performance. (Ronnestad et.al 2014) By enhancing explosive force production and neuromuscular coordination, plyometrics may also contribute to improvements in the cycling economy, allowing athletes to maintain higher speeds at lower energy costs (Bishop et al., 2009).

Cycling has recently become popular at the collegiate level. Including 11 conferences and four disciplines which are road, track, cyclo-cross, and mountain biking. (USA Cycling) Cyclists are faced with rigorous training schedules and academic schedules. Plyometrics are quick and

easily accessible. The application of plyometrics in cycling training remains limited, and most research is focused on sports such as basketball and volleyball. Integrating plyometric exercise into this training regimen of Division II cyclists will significantly enhance their anaerobic power, muscular strength, and sprint performance leading to improved overall cycling efficiency and race performance compared to cyclists to follow a more traditional endurance-based training program.

While endurance remains paramount in cycling, incorporating plyometric training strategically can potentially enhance the explosive power and sprinting ability of collegiate cyclists. This introduction sets the stage for exploring how plyometric exercises can be effectively utilized to complement traditional cycling training, aiming to optimize athletic performance in competitive collegiate cycling environments. The purpose of this research was to assess the effects of a plyometric training program on college-aged cyclists before six weeks of plyometric training, after six weeks of no plyometrics, and after six weeks of plyometric training. The dependent variables included countermovement, static, and drop jump heights and maximal aerobic capacity.

Methods

This study required participants to have three visits to the University of Montevallo Human Performance Laboratory. During visit one, participants will complete the informed consent and the health history questionnaire, then complete the battery of test. During two and three, participants completed a series of test. The figure below is a schematic of research design:

Pre-testing (time point 1) → Six weeks no plyometric training → Mid-testing (time point 2) → Six weeks plyometric training → post-testing (time point 3)

Height, Weight, Body Fat Percentage

Height, weight, and body fat percentage was assessed using the Tanita (Tanita Corporation of America, Arlington Heights, IL), height, weight, and bioimpedance analyses scales, respectively. We measured these variables to report participants body sizes in the posters and manuscripts.

Jumping Performance

– Counter movement jump: With feet underneath the hips, knees extended, and hands on the hips, the participant performed a quarter squat and jumped as high as possible. A goniometer was used to track the joint angle at the knee.

– Static jump: With feet underneath the hips, knees flexed at a jumping angle, and hands on the hips, the participant went down as slow as possible, without bending their trunk, around the same knee angle (measured by the goniometer) reached during the countermovement jump. Participants held that squat position for two to three seconds and would be asked to jump as high as possible without any countermovement.

– Drop jump: Starting from standing on a 7-inch box with the hands on the hips, the participants dropped down to the ground and immediately jumped as high as possible.

The static jump, countermovement, and drop jump included a goniometer attached to the participant's dominant knee to ensure the knee is in the same degrees of flexion for all three jump conditions for each assessment day. The static jump, countermovement jump, and drop jump was performed on a Jump Mat (Just Jump, Probotics Inc. Huntsville, AL) for each assessment day. The Jump Mat assessed the height of the participant's jump.

VO2max test on a cycle ergometer

The VO2max test was performed using the ParvoMedics Metabolic Cart on a Monark 894E Cycle Ergometer (Monark, Vansbro, Sweden). Heart rate was recorded with a Polar H10 heart rate monitor.

Plyometric Training Intervention

The intervention included a six-week, twice per week plyometric training protocol. Plyometrics were done using a proper progressive overload model. Exercises were performed for low repetitions (1-5). For each repetition subjects were asked to perform at peak velocity, height, and effort. The research staff attended the first training session to ensure exercises were performed correctly. Then a research member and/or the captain of the team lead all other sessions. Plyometric exercises included exercises such as drop jumps, squat jumps, box jump, and split jumps

Statistical Analyses

The data was assessed with SPSS version 29. Significance was set at p = 0.005. One-way ANOVA assessed differences between the three time points. Paired sample T-tests assessed differences if there was significance.

Results

The data are reported as mean $\pm$ SD. Table 1 represents the descriptive statistics that were collected from the participants. Their body fat percentage was low, overall, and showed these cyclists were in good health.

Table 1 depicts height, weight, body fat percentage during pre-testing. No changes were found across time points (p > 0.05).

	N	Minimum	Maximum	Mean	Std. Deviation
Age	10	18	23	19.10	1.449
Sex (m=7, f=2)					
Height (cm)	10	152	194	173.50	12.247
Weight (kg)	10	48	102	72.15	15.681
Body fat (%)	10	6	22	12.44	5.630
Valid N (listwise)	10				

Table 2 shows the results from the countermovement jumps. Jump Height improved from time point 2 to 3 (p = 0.032).

Countermovement Jump Height			
	Mean	Std. Deviation	N
CM Jump Height (in)	18.64	4.951	9
2CM Jump Height (in)	18.300	4.5880	9
3CM Jump Height (in)	19.489	4.4563	9

p = 0.032 between time points 2 and 3.

Table 3 shows the results from the drop jump. There were no statistical differences across the time points.

Drop Jump Height			
	Mean	Std. Deviation	N
D Jump Height (in)	18.20	5.125	9

2D Jump Height (in)	18.722	4.9155	9
3D Jump Height (in)	18.833	4.6715	9

p = 0.066 between time points 2 and 3.

Table 4 shows the results from the static jump. Results are not significant but trending (p = 0.066)

Static Jump Height			
	Mean	Std. Deviation	N
S Jump Height (in)	16.80	4.110	9
2S Jump Height (in)	16.444	4.3099	9
3S Jump Height (in)	17.111	4.4211	9

p = 0.56

Table 5 are the results from the VO2max. Statistical difference between time points 1 and 2 (p = 0.007).

VO2 MAX			
	Mean	Std. Deviation	N
VO2max (ml/kg/min)	52.022	9.3465	9
2VO2max (ml/kg/min)	56.200	10.3092	9
3VO2max (ml/kg/min)	53.822	12.3023	9

p = 0.007 between time points 1 and 2.

Discussion

The study looked at the effects of a six-week plyometric training on collegiate cyclists. We hypothesize that the plyometric training would improve the jump height and aerobic capacity. The results showed that the jump height in the countermovement jumps improved, while the static jump was trending but not significant, and drop jump had no differences between time points. The VO2 max did not improve. These results imply that plyometric training will improve jump height but not aerobic capacity in trained cyclists.

The assessment of the counter movement jumps showed that they were the only jumps that increased between time points two and three. The static jump exhibited a trending improvement from time points two and three; which we believe more participants would have elicited a significant increase. The drop jump, however, showed no change. A limitation on the drop jumps given to us by the participants was that the box provided to them during the six weeks of plyometric training was higher than the height for which they were tested during time points one, two, and three. The athletes reported the shorter box height to be an unusual or weird feeling when performing the test. If this study were to be assessed again, we as researchers would provide the same height box so that it is all the same height and hopefully the drop jump results would increase between jumps two and three.

The increase in countermovement jump height agrees with another study that used plyometrics and heavy resistance training to improve running and walking economy in trained runners (Eihara, 2020). Eihara, (2020) exhibited plyometrics and resistance training to have increased jumping height, which, consequently, improved running economy. The study states that a six-to-eight-week plyometric training program is needed to have a greater increase on

running economy. Eihara, (2020) also demonstrated that the enhancement of jumping ability with short contact times induced by plyometric training played a key role in running economy improvement at a faster speed. We believe that the increase in jumping performance found in the present investigation may improve the economy on the bicycle when athletes are performing.

A study which suggested improving jumping ability can improve force production and economy when the cyclist is pedaling was done by Sarkar (2022). These researchers had participants complete a 4-week plyometric and eccentric cycling protocol The results found increased muscular hypertrophy, peripheral factor gradient, glycolytic and oxidative enzyme capacity with proper neuromuscular coordination, which ultimately helps the cyclists to pedal faster with higher muscular power output even for longer time. Therefore, the authors suggest that performing plyometric training may indeed improve mechanisms for improved cycling economy and force output. In our study the increase in jumping ability may lead to improved economy and force output on the bicycle. Production of force is important because an increase in production on the pedals will increase the speed that the cyclist will endure when racing.

For the VO2max test, there was an increase between time points one and two, but no change between test one and three or two and three. The increase in VO2max without plyometric training could be due to the following: cycling training outside of the plyometric training program or the learning effect. These cyclists performed regular cycling training outside of this study, which may lead to an increase in ability to transport oxygen within the cells. In addition, these athletes had never performed a VO2max test in the past. Therefore, during the second trial, the athletes knew what to expect and were more comfortable reaching their true max. However, of note, is all of these athletes reached at least three or four signs of a true VO2max test during all visits. These signs include respiratory equivalent ratio ≥ 1.10, rating of perceived exertion

>16, plateau in VO2 with increasing watts, and maximum heart rate $\pm$ 10 beats. Since the cyclists performed the test twice on the last attempt, they had already known what they were about to do before performing the skill. The participants' aerobic fitness could have also been affected by the current training cycle and or increase of the training cycle during this time of the year, and when they were competing.

Limitations

The sample size of this study is a limitation due to a small sample size of only nine participants of males and females between the ages of 18 to 23. The range of experienced cycling and of prior knowledge of jumps could have affected these results. Another limitation of the study was the uneven number of participants with seven male and two females, since it was not an equal number of both genders these results could not effectively provide the research team with a more accurate assessment of aerobic capacity and jumps. Meaning that with a larger group, we could have provided more results. Last, the training program only lasted six weeks. The authors believe a larger sample size and a longer training program would elicit greater results.

Conclusion

In conclusion plyometric training has a positive effect on the jump height in collegiate cyclists. With only six weeks of plyometric training being implemented into the cyclist training, there was an increase in their jumps showing that plyometric training program did improve the stretch-shortening cycle of the cyclists and potentially increased the stiffness of the calcaneal tendon. This research is important because it demonstrates a short training regimen in cyclists may lead to improvements in cycling performance. t is crucial that cyclists receive a more

specific training program to help increase their athletic performance during their competition season. More research is needed to determine the optimal strategy so that athletes, coaches, and the general community can improve cycling performance in trained, college-aged cyclists.

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FIBONACCI SEQUENCE

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ABSTRACT. This research paper will be focused on analyzing the Fibonacci sequence and its properties. Several papers, articles, and books relating to the sequence will be analyzed and relevant information will be noted. Then, theorems, lemmas, and corollaries that prove important properties of the sequence will be worked through. After that, we will begin our big theorems, proving that F_n can be represented by a formula, utilizing our knowledge of Calculus and infinite series. After that, we will show a formula for generalized Fibonacci sequences that uses Linear Algebra paired with eigenvalues and eigenvectors. The last thing covered will be the convergence relationship between the Fibonacci sequence and the Golden Ratio.

We will first preface our important proofs with necessary background context. The Fibonacci sequence is recursively defined, meaning that any term in the sequence is the sum of the previous two terms. Starting with $F_1 = F_2 = 1$, the Fibonacci equation can be defined as $F_n = F_{n-1} + F_{n-2}$ so long as it obeys the restriction that $n \geq 3$.

1. LITERARY REVIEW

In this section, several research papers and scholarly articles relating to the Fibonacci sequence are analyzed and summarized.

Article 1.1. Numerical patterns in nature.

Review. Published in 1998 by World & I, "Numerical Patterns in Nature" lists several sequences and numbers that are found throughout the natural world. The main three things this specific article mentions are the Titius-Bode sequence, the Fibonacci sequence, and the Golden Ratio. The Titius-Bode sequence is a sequence created in 1776 in which the terms were later found to relate closely to the distances between each planet and the sun in astronomical units. The Golden Ratio is a rectangular ratio that can be used to create logarithmic spirals that can be found in animal horns and is thought to be aesthetically pleasing. The Fibonacci sequence was originally recorded in 1202 by Leonardo of Pisa and is featured as an answer to one of the questions posed in his book, Liber Abaci. This sequence is found throughout nature, specifically in sunflower seeds, daisy petals, and sneeze-wort leaves.

Article 1.2. The Fibonacci Numbers: Exposed More Discretely

Review. In 2003, "The Fibonacci Numbers: Exposed More Discretely" was published by Arthur Benjamin and Jennifer Quinn through the Taylor & Francis Group. The goal of this article is to prove that recursively defined sequences are all part of a larger group of sequences. In this article, the authors use discrete math, math

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stripped down to its most bare and general terms, in order to support their argument. Paired with the Fibonacci sequence here is the sequence of Lucas numbers, which is another sequence in which each term is defined as the sum of the previous two terms. The study employs the use of a generalized "square and domino tiling" in order to make its proposal more visual, allowing easier visualization of the proofs realized within the article.

Article 1.3. Properties of Odd and Even Terms of the Fibonacci Sequence

Review. "Properties of Odd and Even Terms of the Fibonacci Sequence" is an article written by Zvonko Čerin and published in 2006 through Demonstratio Mathematica. The purpose of this article is to improve on a previous study by Rajesh and Leversha through more efficient proofs dealing with the sums of squares of odd terms in the Fibonacci Sequence. At the beginning, several properties relevant to the paper are listed and are used to define terms that would otherwise be too lofty to redefine in each proof. These properties are thus called on in each proof and are even plugged into a mathematics-specific computing system in order to further check the validity of the proposal. The paper defines formulas for sums of both even and odd terms in the sequence.

Article 1.4. The Period, Rank, and Order of the (a, b)-Fibonacci Sequence Mod m

Review. Written by Marc Renault and published through the Taylor & Francis Group in 2013, "The Period, Rank, and Order of the (a, b)-Fibonacci Sequence Mod m" describes and proves several properties of the Fibonacci sequence when it is reduced under a modulus. When a group of numbers is placed under a modulus, it is paired with an appropriate operation (usually multiplication or addition) and a number capacity is set at a fixed number. If the operation on two numbers is equal to this set capacity, then their answer will be equivalent to zero and any remainder is added (with the capacity still applying). This paper uses a generalized modulus m in order to use discrete formulas for the Fibonacci sequence so that a broader conclusion can be reached. Within this article, the author organizes several previously-made proofs and simplifies them, creating a cohesive resource on the topic.

Article 1.5. The Reciprocal Fibonacci Function

Review. Published by the Taylor & Francis Group in 2018, "The Reciprocal Fibonacci Function" was written by Michael Lord. The purpose of this paper is to provide a more efficient means to quickly computing the sum of the inverse Fibonacci numbers. Using the Euler-Binet formula and several other previously-defined formulas, the author finds several ways to represent the reciprocal Fibonacci function. One way is through a sum of numbers, both generalized and specialized, in which the radius of convergence is equal to the Golden Ratio. Throughout the paper, the generalized formula created in the proof is already a generalization of a series of numbers, called the Lambert series. This foreknowledge makes it easier to progress to computations, in which the results converge linearly with the inverse of the Golden Ratio.

Article 1.6. An interesting generalized Fibonacci sequence: a two-by-two matrix representation

FIBONACCI SEQUENCE

Review. In 2020, "An interesting generalized Fibonacci sequence: a two-by-two matrix representation" was written by Gamaliel Cerda-Morales and published by the African Mathematical Union. The point of the paper is to study generalized Fibonacci sequences through a matrix representation. This article uses several previously-defined methods in order to further strengthen the foundation this proposal is laid upon, such as Horadam numbers. Later, a Binet's formula for the generalized Fibonacci sequence is obtained by applying diagonalization to the generating matrix.

Article 1.7. Generalized Pascal's triangles and associated k-Padovan-like sequences

Review. "Generalized Pascal's triangles and associated k-Padovan-like sequences" is a study written by Anatriello, Nèmeth, and Vincenzi and published by the International Association for Mathematics and Computers in Simulation in 2021. This paper focuses on the Pascal triangle and, more specifically, the sequence that occurs from the sums of the elements on the triangle's elements. This sequence is closely related to the Fibonacci sequence for that reason, but this study is dedicated to proving that similar recurrence sequences also allow for prediction and computation. The sequences that are relevant include the Padovan and k-Padovan sequences, with the 0-Padovan sequence case being another way to write out the Fibonacci sequence.

Article 1.8. The golden ratio and the Fibonacci sequence

Review. Published by the Australian Mathematics Education Journal and written by Simon Crawley in 2023, "The golden ratio and the Fibonacci sequence" outlines the relationship between the famous formulas. It is more informational, leaning towards being material for teachers to give to their students and describes the base way to derive a formula for the golden ratio. It is represented two ways, one including nested radicals and the other including nested fractions. The relationship between these numbers is revealed, with the golden ratio being the limit of the ratio between consecutive Fibonacci numbers.

2. Essential Formulas, Theorems, and Lemmas

In this section, several foundational properties of the Fibonacci sequence will be presented and proven. Note that this information can be found in [4].

Theorem 2.1. *Consecutive Fibonacci sequence numbers are relatively prime. In other words, $GCD(F_n, F_{n+1}) = 1$ for all $n > 1$.*

Proof. Proof by Contradiction:
Assume there is some number $d > 1$ such that $d|F_n$ and $d|F_{n+1}$ for some $n \geq 1$. Due to this, there are integers j, k such that $dj = F_n$ and $dk = F_{n+1}$. If we take these redefinitions and plug them into the Fibonacci formula, the equation $F_{n+1} = F_n + F_{n-1}$ becomes $dk = dj + F_{n-1}$. If we subtract dj from both sides, we get $dk - dj = F_{n-1}$, in which the d can be factored out on the left side to become $d(k - j) = F_{n-1}$. If we were to define quantity $(k - j)$ as some other integer, then d times that integer is equal to F_{n-1}, which is the definition of divides. Therefore, $d|F_{n-1}$. Continuing this process, we get that $d|F_{n-2}$, $d|F_{n-3}$ and so on until we get $d|F_1$. But since we already know that $F_1 = 1$ and that the only number that divides 1 is itself, we have reached a contradiction in that $d > 1$. Instead, it can only be equal to it. So, $d = 1$. $\square$

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Theorem 2.2. $F_{m+n} = F_{m-1}F_n + F_m F_{n+1}$

Proof. Proof by Induction on n.
When $n = 1$, we have $F_{m+1} = F_{m-1}F_1 + F_m F_2$, which can be plugged into the Fibonacci formula to get $F_{m+1} = F_{m-1} + F_m$ because we know that $F_1 = F_2 = 1$. Now, assume that the equality holds for all $n = 1$, $n = 2$ ... $n = k$.
Using $n = k$, we now have that $F_{m+k} = F_{m-1}F_k + F_m F_{k+1}$. Since we have assumed the case holds true for all $n = 1$ to $n = k$, we can assume the same validity holds for $k-1$. So, using the case of $n = (k-1)$, we get $F_{m+(k+1)} = F_{m-1}F_{k-1} + F_m F_k$. Now, if we add these two equations and factor, we get the equation $F_{m+(k+1)} = F_{m-1}(F_k + F_{k-1}) + F_m(F_{k+1} + F_k)$. Using the Fibonacci equation, the final equation becomes $F_{m+(k+1)} = F_{m-1}F_{k+1} + F_m F_{k+2}$, which was the equation we needed. Therefore, the statement holds true by induction. $\square$

Theorem 2.3. *For integers* $m, n \geq 1, F_m | F_{mn}$.

Proof. Proof by Induction on n:
When $n = 1$, clearly $F_m | F_m$.
Assume that $F_n | F_{mn}$ for all $n = 1$, $n = 2$, ... $n = k$.
From Theorem 2.2, we know that $F_{m+n} = F_{m-1}F_n + F_m F_{n+1}$. Now, substituting mk for m and m for n gives us the equation $F_{mk+n} = F_{mk-1}F_m + F_{mk}F_{m+1}$. By our assumption, $F_m | F_{mk}$, so there is an integer j such that $F_m j = F_{mk}$. Now, substituting that into the first equation, we get that $F_{mk+m} = F_{mk-1}F_m + F_m j F_{m+1}$ which can be factored into $F_{mk+m} = F_m(F_{mk-1} + j F_{m+1})$. If we define everything between the parentheses to be some integer, then we have that F_m multiplied by that integer is equal to F_{mk+m}. This, by definition, means that $F_m | F_{mk+m}$. This can be factored into our desired equation, in which we end up with $F_m | F_{m(k+1)}$. Therefore, the statement holds by induction. $\square$

The next several lemmas will be useful in future theorems.

Lemma 2.1. *If* $b|c$, *then* $GCD(a+c, b) = GCD(a, b)$.

Proof. Assume that $b|c$. Then, by definition, there is some integer k such that $bk = c$. Also assume that $GCD(a, b) = d$. This means that there are integers j, l such that $dj = a$ and $dl = b$. Taking $a + c$ and substituting the terms with their redefinitions, we get $dj + bk$ which becomes $dj + dlk$. Factoring gets $d(j + lk)$. If we let $(j + lk)$ be represented by some integer, then d times some integer is equal to $a + c$, so $d|(a + c)$. Now, assume that there is some integer e such that $e|(a+c)$, $e|b$, and $e > d$. This must mean that there are some integers m, n such that $em = a + c$ and $en = b$. Although unusual, we can define $a = a + c - c$. If we plug in redefinitions, we get that $a = em - bk$, doing that step again we get $a = em - enk$. Factoring that, we get $a = e(m - nk)$, and, by representing $(m - nk)$ as some integer and using the definition of divides, we get that $e|a$. So, $e|a$ and $e|b$, but we reach a contradiction because $GCD(a, b) = d$. Therefore, $e = d$ and, further, $GCD(a + c, b) = GCD(a, b)$ $\square$

Lemma 2.2. *If* $GCD(a, c) = 1$, *then* $GCD(a, bc) = GCD(a, b)$.

Proof. Assume $GCD(a, c) = 1$. Let $GCD(a, bc) = d$ and $GCD(a, b) = e$. So, $e|a$, $e|b$, and $e|bc$. It logically follows that e is a common divisor of a and bc. So, $e \leq d$. Since $d = GCD(a, bc)$, there must be integers j, k such that $dj = a$ and $dk = bc$. Further, because $GCD(a, c) = 1$, we know that there are integers x, y such that

$ax+cy = 1$. If we substitute the redefinitions into this equation, we get $djx+cy = 1$. If we multiply across by b, we get $bdjx + bcy = b$. Again, substituting what we can, $bdjx + dky = b$. Factoring, we end up with $d(bjx + ky) = b$. By definition,, this means that $d|b$. Thus, d is a common divisor of a and b. Therefore, $d \leq e$. This leaves us with both of the inequalities $e \leq d$ and $d \leq e$. So, we can conclude that $e = d$. $\square$

Lemma 2.3. *If $m = qn + r$, then $GCD(F_m, F_n) = GCD(F_r, F_n)$.*

Proof. Assume $m = qn + r$. By Theorem 2.2, we have that $GCD(F_m, F_n) = GCD(F_{qn+r}, F_n) = GCD(F_{qn-1}F_r + F_{qn}F_{r+1}, F_n)$. By Theorem 2.3, we know that $F_n|F_{qn}$. Now, by using Lemma 2.1 with the following substitutions: $a = F_{qn-1}F_r$, $b = F_n$, and $c = F_{qn}F_{r+1}$, we get $GCD(F_{qn-1}F_r + F_{qn}F_{r+1}, F_n) = GCD(F_{qn-1}F_r, F_n)$. Now, we know that the $GCD(F_m, F_n) = GCD(F_{qn-1}F_r, F_n)$. Let $GCD(F_{qn-1}, F_n) = d$. Then, $d|F_n$ and $d|F_{qn-1}$. Since $F_n|F_{qn}$, $d|F_{qn}$. Because d divides consecutive Fibonacci numbers, by Theorem 2.1, $d = 1$. Using Lemma 2.2 and the substitutions $a = F_n$, $b = F_r$, and $c = F_{qn-1}$, we get that $GCD(F_n, F_r F_{qn-1}) = GCD(F_n, F_r)$. Therefore, $GCD(F_m, F_n) = GCD(F_{qn-1}F_r, F_n) = GCD(F_r, F_n)$. $\square$

Theorem 2.4. *The greatest common divisor of two Fibonacci numbers is a Fibonacci number. More specifically, if $GCD(m, n) = d$, then $GCD(F_m, F_n) = F_d$.*

Proof. Assume that $GCD(m, n) = d$. Without loss of generality, assume $m \geq n$. By the Euclidean Algorithm, we have that:

$$
\begin{aligned}
m &= q_1 n + r_1, & 0 < r_1 < n \\
n &= q_2 r_1 + r_2, & 0 < r_2 < r_1 \\
r_1 &= q_3 r_2 + r_3, & 0 < r_3 < r_2 \\
&\vdots \\
r_{n-2} &= q_n r_{n-1} + r_n & 0 < r_n < r_{n-1} \\
r_{n-1} &= q_{n+1} r_n + 0
\end{aligned}
$$

By Lemma 2.3, $GCD(F_m, F_n) = GCD(F_{r_1}, F_{r_2}) = ... = GCD(F_{r_{n-1}}, F_{r_n})$. But $r_n|r_{n-1}$, so by Theorem 2.3, $F_{r_n}|F_{r_{n-1}}$ and $GCD(F_{r_n}, F_{r_{n-1}}) = F_{r_n}$. By the Euclidean Algorithm, $GCD(m, n) = r_n$, which is the last non-zero remainder. So, $GCD(m, n) = d = r_n$. Now, we know that $GCD(F_m, F_n) = F_{r_n} = F_d$. $\square$

Corollary 2.1. *$F_m|F_n$ if and only if $m|n$ for $n \geq m \geq 3$.*

Proof. $\Leftarrow$ Assume $m|n$. By Theorem 2.3, $F_m|F_n$.
$\Rightarrow$ Assume $F_m|F_n$. Then, $GCD(F_m, F_n) = F_m$. By Theorem 2.4, $GCD(m, n) = m$. Therefore, $m|n$. $\square$

3. Calculus and Infinite Series

Now that all of the background information has been covered, the main proof may now commence. This proof will span the section and utilize our knowledge of Calculus. Note that the basis for this information can be found in [2].

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Theorem 3.1.
$$F_n = \frac{1}{\sqrt{5}}\left(\left(\frac{1+\sqrt{5}}{2}\right)^n - \left(\frac{1-\sqrt{5}}{2}\right)^n\right)$$

Proof. To begin, let the generating function, $G(z)$, be defined as:

$$G(z) = \sum_{n=0}^{\infty} F_n z^n = 0 + z + z^2 + 2z^3 + 3z^4 + 5z^5 + 8z^6 + ...$$

$$zG(z) = z\sum_{n=0}^{\infty} F_n z^n = z^2 + z^3 + 2z^4 + 3z^5 + 5z^6 + ...$$

$$z^2G(z) = z^2\sum_{n=0}^{\infty} F_n z^n = z^3 + z^4 + 2z^5 + 3z^6 + 5z^7 + ...$$

If we subtract these functions, the only term left is z, so, by setting the equation up and solving for $G(z)$, we find a way to take a closer look at the properties of the Fibonacci numbers.

$$G(z) - zG(z) - z^2G(z) = z$$

$$G(z)(1 - z - z^2) = z$$

$$G(z) = \frac{z}{1 - z - z^2}$$

$$G(z) = \frac{-z}{z^2 + z - 1}$$

Looking specifically at the denominator on the right side, notice that the quadratic formula is applicable and results in possible roots $z = \frac{-1\pm\sqrt{5}}{2}$. With that, we define:

$$\alpha = \frac{-1+\sqrt{5}}{2} \qquad\qquad \beta = \frac{-1-\sqrt{5}}{2}$$

Note the following for simplification sake:

(1)
$$\alpha\beta = -1$$

(2)
$$\alpha + \beta = -1$$

(3)
$$\alpha - \beta = \sqrt{5}$$

The next section of the proof will be dedicated to showing that: $\frac{1}{\sqrt{5}}(\frac{\alpha}{\alpha-z} - \frac{\beta}{\beta-z}) = \frac{-z}{z^2+z-1}$. To begin:

$$\frac{1}{\sqrt{5}}\left(\frac{\alpha}{\alpha-z}\left(\frac{\beta-z}{\beta-z}\right) - \frac{\beta}{\beta-z}\left(\frac{\alpha-z}{\alpha-z}\right)\right)$$

$$= \frac{1}{\sqrt{5}} \left(\frac{\alpha\beta - \alpha z - \alpha\beta + \beta z}{(\alpha - z)(\beta - z)} \right)$$

$$= \frac{1}{\sqrt{5}} \left(\frac{-z(\alpha - \beta)}{\alpha\beta - \alpha z - \beta z + z^2} \right)$$

$$= \frac{1}{\sqrt{5}} \left(\frac{-z(\alpha - \beta)}{\alpha\beta - z(\alpha + \beta) + z^2} \right)$$

$$= \frac{1}{\sqrt{5}} \left(\frac{-z(\sqrt{5})}{(-1) - z(-1) + z^2} \right) = \frac{-z}{-1 + z + z^2} = G(z)$$

Recall that the sum of a geometric series takes form $\frac{a}{1-r}$, with a being the first term in the sequence and r being the ratio of the geometric series. Looking at the number we just proved was equal to $G(z)$, we notice that its inside fractions can be algebraically altered to take the same form of a geometric series sum.

$$G(z) = \frac{1}{\sqrt{5}} \left(\frac{\alpha}{\alpha - z} \left(\frac{\frac{1}{\alpha}}{\frac{1}{\alpha}} \right) - \frac{\beta}{\beta - z} \left(\frac{\frac{1}{\beta}}{\frac{1}{\beta}} \right) \right)$$

$$G(z) = \frac{1}{\sqrt{5}} \left(\frac{1}{1 - \frac{z}{\alpha}} - \frac{1}{1 - \frac{z}{\beta}} \right)$$

Now, those inside fractions look like two geometric series sums, one with ratio $\frac{z}{\alpha}$, one with ratio $\frac{z}{\beta}$, and both with their leading term, or a, equal to 1. This means that we can substitute the sum for the formal sigma format.

$$G(z) = \frac{1}{\sqrt{5}} \left(\sum_{n=0}^{\infty} \left(\frac{z}{\alpha} \right)^n - \sum_{n=0}^{\infty} \left(\frac{z}{\beta} \right)^n \right)$$

$$G(z) = \frac{1}{\sqrt{5}} \left(\sum_{n=0}^{\infty} \left(\frac{z^n}{\alpha^n} - \frac{z^n}{\beta^n} \right) \right)$$

$$G(z) = \frac{1}{\sqrt{5}} \left(\sum_{n=0}^{\infty} z^n \left(\left(\frac{1}{\alpha} \right)^n - \left(\frac{1}{\beta} \right)^n \right) \right)$$

Recall that $\alpha\beta = -1$. In this case: $\frac{1}{\beta} = -\alpha$ and $\frac{1}{\alpha} = -\beta$.

$$G(z) = \frac{1}{\sqrt{5}} \sum_{n=0}^{\infty} z^n ((-\beta)^n - (-\alpha)^n)$$

Recall also that $G(z) = \sum_{n=0}^{\infty} F_n z^n$.

$$\sum_{n=0}^{\infty} F_n z^n = \frac{1}{\sqrt{5}} \sum_{n=0}^{\infty} z^n ((-\beta)^n - (-\alpha)^n)$$

$$F_n = \frac{1}{\sqrt{5}} ((-\beta)^n - (-\alpha)^n)$$

$$F_n = \frac{1}{\sqrt{5}} \left(\left(\frac{1+\sqrt{5}}{2} \right)^n - \left(\frac{1-\sqrt{5}}{2} \right)^n \right)$$

$\square$

4. Linear Algebra with Matrices Containing Eigenvectors and Eigenvalues

In this proof, we will find a formula for general Fibonacci sequences, or sequences that are Fibonacci-like using Linear Algebra with eigenvectors and eigenvalues.

Definition 4.1. A square matrix A is diagonalizable if it is similar to a diagonal matrix. In other words, $A = PDP^{-1}$ for some diagonal matrix D and invertible matrix P.

Definition 4.2. An eigenvector of a square matrix A is a nonzero vector x such that $A\vec{x} = \lambda\vec{x}$ for some scalar λ, called the eigenvalue that corresponds to the eigenvector.

Theorem 4.1.

$$H_n = \frac{1}{-\sqrt{5}} (\alpha^{n-1}(a\beta - b) - \beta^{n-1}(a\alpha - b))$$

Proof. Let H_n be a general Fibonacci sequence. In other words, let $H_0 = 0$, $H_1 = a$, and $H_2 = b$. Then $H_n = H_{n-1} + H_{n-2}$ for all $n \geq 3$ and $\begin{bmatrix} H_1 \\ H_2 \end{bmatrix} = \begin{bmatrix} a \\ b \end{bmatrix}$. Now, we will do some computations to see if there is a pattern.
Letting $n = 2$:

$$\begin{bmatrix} H_2 \\ H_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} H_1 \\ H_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} b \\ a+b \end{bmatrix}$$

Letting $n = 3$:

$$\begin{bmatrix} H_3 \\ H_4 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} H_2 \\ H_3 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}^2 \begin{bmatrix} H_1 \\ H_2 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} a+b \\ a+2b \end{bmatrix}$$

Letting $n = 4$;

$$\begin{bmatrix} H_4 \\ H_5 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} H_3 \\ H_4 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}^3 \begin{bmatrix} H_1 \\ H_2 \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} a+2b \\ 2a+3b \end{bmatrix}$$

We can see a pattern now.

$$\begin{bmatrix} H_n \\ H_{n+1} \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}^{n-1} \begin{bmatrix} a \\ b \end{bmatrix}$$

We will define matrix $A = \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}$. Now, we will diagonalize this matrix by finding a diagonal matrix D and an invertible matrix P, such that $A = PDP^{-1}$. To start this, we must find the eigenvalues and eigenvectors of A by setting $det(A - \lambda I) = 0$.

$$det(A - \lambda I) = det \begin{bmatrix} -\lambda & 1 \\ 1 & 1 - \lambda \end{bmatrix} = -\lambda(1 - \lambda) - 1 = \lambda^2 - \lambda - 1 = 0$$

This quadratic is not factorable, but the quadratic equation gives us roots $\lambda = \frac{1 \pm \sqrt{5}}{2}$. We define:

$$\alpha = \frac{1 + \sqrt{5}}{2} \qquad\qquad \beta = \frac{1 - \sqrt{5}}{2}$$

Note that these values are slightly different than the ones in the previous proof. Since α and β are eigenvalues, we now have to find the corresponding eigenvectors. Let $\lambda = \alpha$. Then $A - \lambda I = A - \alpha I$. Performing elementary row reduction operations on this matrix, we get:

$$\begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} - \begin{bmatrix} \alpha & 0 \\ 0 & \alpha \end{bmatrix} = \begin{bmatrix} -\alpha & 1 \\ 1 & 1 - \alpha \end{bmatrix} R_1 \leftrightarrow R_2 \begin{bmatrix} 1 & 1 - \alpha \\ -\alpha & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 - \alpha \\ -\alpha & 1 \end{bmatrix} R_2 \Rightarrow \alpha R_1 + R_2 \begin{bmatrix} 1 & 1 - \alpha \\ 0 & -\alpha^2 + \alpha + 1 \end{bmatrix}$$

Note that $-\alpha^2 + \alpha + 1$ can be rewritten as $-(\alpha^2 - \alpha - 1) = 0$ since α is a solution to $\lambda^2 - \lambda - 1 = 0$. So, the matrix becomes $\begin{bmatrix} 1 & 1 - \alpha \\ 0 & 0 \end{bmatrix}$. Row 1 is equivalent to $x_1 = -(1 - \alpha)x_2$ and since x_2 is a free variable, we can let $x_2 = x_2$. So:

$$\vec{x} = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} (-1 + \alpha)x_2 \\ x_2 \end{bmatrix} = x_2 \begin{bmatrix} (-1 + \alpha) \\ 1 \end{bmatrix}$$

Now, if we let $x_2 = \alpha$, we get

$$\vec{x} = \alpha \begin{bmatrix} \alpha - 1 \\ 1 \end{bmatrix} = \begin{bmatrix} \alpha^2 - \alpha \\ \alpha \end{bmatrix}$$

Since α is a solution of $\lambda^2 - \lambda - 1 = 0$, we know that $\alpha^2 - \alpha - 1 = 0$ becomes $\alpha^2 - \alpha = 1$. Thus

$$\vec{v_1} = \begin{bmatrix} 1 \\ \alpha \end{bmatrix}$$

. Now, letting $\lambda = \beta$, we have that $A - \lambda I = A - \beta I = \begin{bmatrix} -\beta & 1 \\ 1 & 1 - \beta \end{bmatrix}$. A very similar process is followed to find the eigenvector for β. We find that:

$$\vec{v_2} = \begin{bmatrix} 1 \\ \beta \end{bmatrix}$$

Now, we can construct our matrices D and P in order to diagonalize A. We see that:

$$D = \begin{bmatrix} \alpha & 0 \\ 0 & \beta \end{bmatrix} \quad \text{and} \quad P = \begin{bmatrix} 1 & 1 \\ \alpha & \beta \end{bmatrix}$$

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First,

$$P^{-1} = \frac{1}{\beta - \alpha} \begin{bmatrix} \beta & -1 \\ -\alpha & 1 \end{bmatrix}$$

Note that $\beta - \alpha = -\sqrt{5}$. So

$$P^{-1} = -\frac{1}{\sqrt{5}} \begin{bmatrix} \beta & -1 \\ -\alpha & 1 \end{bmatrix}$$

Now that we have all of that, we get:

$$\begin{bmatrix} H_n \\ H_{n+1} \end{bmatrix} = A^{n-1} \begin{bmatrix} a \\ b \end{bmatrix} = (PDP^{-1})^{n-1} \begin{bmatrix} a \\ b \end{bmatrix} = PD^{n-1}P^{-1} \begin{bmatrix} a \\ b \end{bmatrix}$$

And if we multiply the matrices $PD^{n-1}P^{-1} \begin{bmatrix} a \\ b \end{bmatrix}$ out, we end with a formula to finalize this proof.

$$A^{n-1} \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ \alpha & \beta \end{bmatrix} \begin{bmatrix} \alpha^{n-1} & 0 \\ 0 & \beta^{n-1} \end{bmatrix} \frac{1}{-\sqrt{5}} \begin{bmatrix} \beta & -1 \\ -\alpha & 1 \end{bmatrix} \begin{bmatrix} a \\ b \end{bmatrix}$$

$$= \frac{1}{-\sqrt{5}} \begin{bmatrix} 1 & 1 \\ \alpha & \beta \end{bmatrix} \begin{bmatrix} \alpha^{n-1} & 0 \\ 0 & \beta^{n-1} \end{bmatrix} \begin{bmatrix} a\beta - b \\ -a\alpha + b \end{bmatrix}$$

$$= \frac{1}{-\sqrt{5}} \begin{bmatrix} 1 & 1 \\ \alpha & \beta \end{bmatrix} \begin{bmatrix} \alpha^{n-1}(a\beta - b) \\ \beta^{n-1}(-a\alpha + b) \end{bmatrix}$$

$$= \frac{1}{-\sqrt{5}} \begin{bmatrix} \alpha^{n-1}(a\beta - b) + \beta^{n-1}(-a\alpha + b) \\ \alpha^n(a\beta - b) + \beta^n(a\alpha + b) \end{bmatrix} = \begin{bmatrix} H_n \\ H_{n+1} \end{bmatrix}$$

We can now show the formula for any term in the sequence. For any $n \geq 2$

$$H_n = \frac{1}{-\sqrt{5}}(\alpha^{n-1}(a\beta - b) - \beta^{n-1}(a\alpha - b))$$

$\square$

5. THE GOLDEN RATIO

We have seen the golden ratio $\frac{1+\sqrt{5}}{2}$ this whole time. It turns out that the ratio of consecutive Fibonacci terms approaches the golden ratio as n goes to infinity.

Theorem 5.1.

$$\lim_{n \to \infty} \frac{F_{n+1}}{F_n} = \frac{1 + \sqrt{5}}{2}$$

Proof. Let $\alpha = \frac{1+\sqrt{5}}{2}$ and $\beta = \frac{1-\sqrt{5}}{2}$. From Theorem 3.1, we know that $F_n = \frac{1}{\sqrt{5}}(\alpha^n - \beta^n)$, so $F_{n+1} = \frac{1}{\sqrt{5}}(\alpha^{n+1} - \beta^{n+1})$. Taking the limit of the ratio gets us:

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$$\lim_{n\to\infty} \frac{F_{n+1}}{F_n} = \lim_{n\to\infty} \frac{\frac{1}{\sqrt{5}}(\alpha^{n+1} - \beta^{n+1})}{\frac{1}{\sqrt{5}}(\alpha^n - \beta^n)}$$

$$= \lim_{n\to\infty} \frac{\alpha^{n+1} - \beta^{n+1}}{\alpha^n - \beta^n}$$

$$= \lim_{n\to\infty} \frac{(\alpha^{n+1} - \beta^{n+1})(\frac{1}{\alpha^{n+1}})}{(\alpha^n - \beta^n)(\frac{1}{\alpha^{n+1}})}$$

$$= \lim_{n\to\infty} \frac{1 - (\frac{\beta}{\alpha})^{n+1}}{\frac{1}{\alpha} - \frac{1}{\alpha}(\frac{\beta}{\alpha})^n}$$

$$= \lim_{n\to\infty} \frac{1}{\frac{1}{\alpha}}$$

$$= \lim_{n\to\infty} \alpha$$

Note that since $\frac{\beta}{\alpha}$ is approximately -0.4, both $(\frac{\beta}{\alpha})^{n+1}$ and $(\frac{\beta}{\alpha})^n$ will approach 0 as n approaches ∞. Thus, the limit of consecutive Fibonacci terms approach α, which is equal to $\frac{1+\sqrt{5}}{2}$!

$\square$

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The Correlation of Internalized Self-Perception and Restrictive Parenting

Parrissa Williams

Abstract: When examining various parenting styles, is there one that impacts the bond between a parent and their adolescent child? This paper will address this question, while comparing the differences in parenting approaches, and how "Helicopter" parenting may affect this bond. There will be an expansive discussion of how research has proven the different variations of how the interaction between peers and family is crucial during development. Views on social and emotional interaction changes will be exchanges about an individual's self-perception and identity, allowing one to learn about one's environment. Many factors contribute to negative emotions, such as depression, anxiety, and nervousness, which can disrupt the way an individual views society and many of these differences can be caused by attachment styles. Attachment styles is a study conducted on the foundation of which children are developing and how it will impact their social and emotional relationships. As this research question is answered throughout the article, there will be a concluding explanation as to how restrictive parenting stunts a child's development, and how healthy attachment styles should be adapted through teaching practices at home from parents.

Keywords: parenting styles, self-identity, attachment styles, emerging adulthood, helicopter parenting

INTRODUCTION

Social interaction develops and occurs at an early age and becomes more consistent throughout school and at home. When children are provided with opportunities that support their social and emotional development, beginning with the initial bond between parent and child, they may have more successful interactions with their environment. Social-emotional development covers two important components of development, which include the development of self, or temperament, and the relationship to others, or attachment (Malik & Marwaha, 2018). They may be less likely to act out, given that they may have a clearer understanding of their environment. As children develop trust through early relationships, they learn to seek out their parent or caregiver during times of emotional stress. In addition, they learn to express their emotions in appropriate ways, establish strategies for emotional regulation, and practice impulse control. Behaviors reflecting this development include turn-taking interactions (4-5 months of age), interactive play like peek-a-boo (12 months of age), pretend play (18 - 30 months of age), sharing and problem solving (36 months of age), and following simple rules or directions (age 5 years). The older children become, the more influence their peers have and their desire to seek more independence increases.

Parents participation in their children's social and emotional development is beneficial to both them and their children. Once parents can engage in their children's learning and aid them while encouraging them, they direct the child toward a more controlled behavioral state. Parental involvement in a child's life is abundant during the period of teaching them right from wrong. Parents should try to incorporate implement authoritative styles at home, which would result in a more prominent outcome, than only having the child learn from a school environment. Being

involved is essential when it comes to supporting and showing compassion towards children while creating a healthy, secure attachment child between parent and child.

During the beginning of childhood, something connects children with their parents or guardians, allowing them to bond and feel secure as they develop through their lives. This bond cannot be formed overnight and has a profound impact on "normal development" (Sharma, 2016). Furthermore, research shows that a parent that responds to their child's needs with consistency and sensitivity sends a sequence of key messages that allow trust and security to develop. Bowlby's Attachment Theory states that "an infant's first attachment experience, initially to his or her mother, profoundly shapes the social, cognitive, and emotional development that follow" (Bowlby, 1969). As children grow and develop, finding a parenting style that allows their children to feel comfortable enough to confide in them without the feeling of insecurity is something that many parents strive to reach. Parenting styles are remarkably diverse and range from positive to negative effects. A more positive parenting style that supports the development of children is authoritative parenting, which allows the child to have room to express their emotional concerns and face the consequences based on their harmful actions. Moderate control combined with warmth promotes psychological autonomy in this approach (Sharma, 2016). A less positive style of parenting is the authoritarian style, which is extremely demanding and less responsive towards their children's needs. Parents who are demanding exhibit more negative responses alongside overly active parents. Authoritative parenting is one of the most positive and suggested types of parenting that should be adopted in households and taught by parents. Authoritative parenting nurtures children and provides them the warmth, comfort, and stability they need to form healthy interpersonal connections within their environment and create identity (Holliday, M. 2023). Authoritative parenting has equal security and discipline; this parenting

style results in children developing higher self-esteem, more school participation, and less likely to be involved in inadequate behaviors (Garcia, O. F., & Serra, E. (2019). Permissive parenting styles are more pampering toward children and include more involvement in a child's life, which can be suffocating due to the lack of discipline and over-involvement in their lives, leaving them the opportunity to develop independence. Authoritarian parenting style is a parenting style that is more restrictive and controlling when it comes to raising a child. However, authoritarian parents are slightly engaged in their child's life, which leads to the child having a more negative environmental perspective and adverse emotions such as anxiety and depression.

Restrictive parenting is an issue that many people look over and a repetitive problem that has occurred for many decades to the present time. Helicopter parenting occurs when parents are too involved in their child's life and do not give them space to develop independently. When it comes to the occurrences and outcomes of helicopter parenting, certain behaviors—especially in school-based settings, are decreased, and certain aspects, such as anxiety and depression, are higher (Okray, Z. 2016). Mental health concerns in children and adolescents are related to insecure thoughts and predispositions and are displayed as a correlation between parenting styles and behaviors. The way parents mold and teach their children follows them during their teenage years and adulthood, further showing how negatively it affects their growth. Many of the different psychological concerns that arise are during the late teenage years and early adulthood, seeing that is when they are out of the house and have more access to alcohol. That is where the topic of substance abuse is introduced in adulthood. Substance abuse during emerging adulthood is an issue that is correlated to helicopter parenting (Cook et al, 2020).

Overactive involvement in children's lives regarding their development has a negative correlation when it comes to finding a well-suited parenting style. This type of parenting can be

defined as helicopter parenting—when a parent hovers and does not allow room for growth (Okray, Z. 2016). This type of parenting is associated with high depression and anxiety rates, low self-esteem, and strains the bond built. During the early age of development, having space to develop and grow is extremely important because that is the time when young children and teens are around their peers who may act differently than they do due to the differences in parenting styles. Learning to make "good" choices and recognize consequences is a part of developing critical thinking. As children emerge into their adolescence years and adulthood, there is significant variability in their behaviors, such as a correlation of substance abuse and depression. Adolescence is the critical transitional stage of physical and mental human development between childhood and adulthood. Biological, social, and psychological changes transpire during this time causing a variety of results to occur that could be negative or positive. (Sharman, 2016).

Helicopter parenting

The interactions between parents and their young or adolescent children affect them internally and externally. Research provides details explaining how although both parents influence their child's internal and external development, paternal factors have more of a prevalent external effect (Ong, M. Y. et al., 2018). This article shows that fathers have more external effects on their children, but only when lowering the risk of developing those external problems for the children who already have those external troubles. Paternal parenting is more effective for externalizing difficulties and minimizing those issues based on how a child feels internally and how the parenting style impacts their life (Ong M. Y. et al., 2018). Paternal influences on the external issues within a child are determined by the father having a more protective presence in their child's life, which is prominent in the more positive parenting shown within the father. Parenting will be more likely to be positive based on the child's temperament,

behavior, or negatively shaped emotions. When children have support from their maternal and paternal factors, they are more likely to have positive outcomes, such as self-reliance and lower mental issues (Ong, M. Y. et al., 2018). Within different countries and cultures, there have been differences in how they raise their child and how it affects their mental health. Some of the parenting styles studied would be Asian and European-American cultures. In Asian households, the adapted parenting style is more controlling and less affectionate than in European households. When it comes to adapting parenting styles and parents trying to find the best one to utilize, there have been intervention programs that help these parents learn which parenting styles have more positive mental health outcomes for their children (Ong, M. Y. et al., 2018). Some parenting styles are correlated with more positive behaviors from children when there are differences between parenting within the maternal and paternal dynamics; therefore, positive benefits for the child are formed, and an understanding of parent-child bonds is justified (Ong, M. Y. et al., 2018).

IMPLICATIONS:

Internalizing unaddressed emotions—such as stated previously as depression, anxiety, and other psychological concerns—is correlated to negative coping strategies and behavioral differences or actions that generate occurrences of substance abuse, behavioral issues, and suicide (Balan, R. et al., 2017). There has also been considerable amount of research that traces school burnout towards children who experience helicopter parenting. Due to the number of children who experience anxiety, depression, and troubles with interacting in school based on this style of parenting, the results of school burnout are prominent. Prevalent

Worth mentioning, as there are plenty of resources that imply helicopter parenting as being negative, there are also sources that state this parenting style can have a positive impact. Having parents who are heavily involved in an emerging adult's life could lead to optimistic outcomes and behaviors such as higher self-confidence or independence (Reed, K. et al, 2016). Another word for positive helicopter parenting is autonomy supportive parents who are involved in their child's life, all the while allowing their child to form their own independence and opinions. Although there are benefits in childhood for helicopter parenting, the negative impact outweighs the positive influences.

DISCUSSION:

The purpose of this research is to show that parenting styles are a huge contribution towards the way a child or adolescent's identity is formed based on restrictive parenting. During this study, there is representation of how parents have the ability to shape a child's temperament in which could affect their emotions negatively or positively. The results from the study of the restrictive parenting style, helicopter parenting, has been presented as negative focusing specifically on the affects or depression and anxiety.

When working with families, practitioners and other professionals want to consider the background and unique experiences of the individuals they are working with. Parenting tends to follow generational patterns and not all families are aware that various parenting styles exist.

Parents who communicate with their children about behaviors they may view as misbehavior discuss boundaries, expectations, and rules that are advised to be followed to avoid discipline if set rules are not followed. To ensure rules are consistent, including implementing

discipline and other measures to abide by parental instruction, parents must ensure that the rules they want their child to follow are of priority to allow the child to remember and retain set regulations. When teaching children about consequences, parents have to ensure that the same actions are applied each time the child misbehaves or regards set rules; this way, the child understands responsibilities. It is essential when you first begin to teach children about consequences based on their behavior to ensure the way of teaching is positive and consistent. Most parents believe that controlling their children has the best outcomes. Still, the best outcomes accumulate through positive ways to build a positive bond, especially when deciding the most effective way of discipline. Parents should also remember that it requires patience, calmness, undivided attention, and understanding regarding their children's behaviors and emotions, as well as how to regulate those circumstances and help them process them by teaching them communication.

Parents who are determining their children's mode of behavior management are advised to be calm and patient and to have the ability to adequately provide their child with an effective behavioral plan and regulations to guide the child away from negative behaviors. Therefore, a sense of responsibility is retained and understood, specifically when comprehending the differences between negative and positive behaviors. Determining the dissimilarity between behavioral management and punishment is required when entering the stage needed for a child to understand their behavioral responsibilities

When beginning to teach a child about the consequences of their behavior, ensuring the particular way of guidance is positive and consistent is crucial. Parents who attempt to control their child consistently may risk straining the positive bond built within families, especially

regarding the most effective way of behavioral management. Considering that the parent and child established a positive bond, applying and enforcing behavioral management should be relatively obtainable and understandable from both perspectives. Several strategies that are adopted when teaching behavioral practices to their child, such as preventing, promoting, and addressing behaviors (Parents as Teachers, 2014). The behavioral strategies recommended that parents should include start with prevention, which are rules and expectations set and are reasonable based on the child's age. The second behavioral management that parents should utilize is promoting a sense of independence and talking about encouraged actions. The third behavioral management strategy is addressing behaviors, including praising them for positive actions, announcing when the child has done something correctly (or attempted to), and ensuring that the parent is showing that they are proud of their child's attempts and measures utilized to follow set parental rules.

Nurturing recreates a considerable role when bonding with children due to the positive connection that is obtained. There is a difference between caring, nurturing, and hovering over one's child. Parental interaction with their child allows them to have the ability to correlate positive relationships and develop positive views of the world around them (Parents as Teachers, 2014). When raising a child, there is more to just teaching and practicing behavioral management to obtain positive personal outcomes; the way parents interact and comfort them is immensely significant as well. Parents need to learn when to train their children when they achieve or attempt to achieve something progressive, alongside acknowledging that making mistakes is normal and allowing them to grow as a person. Allowing a child to make choices and mistakes can allow them to form dependance and a sense of responsibility. Having those choices can

allow a child to feel a sense of control to be able to have possibilities without feeling like they are trapped within certain rules.

CONCLUSION:

When researching the effects of the different parenting styles, the psychological health of individuals is something to look out for, especially since children who undergo restrictive parenting struggle more mentally. Incorporating healthy ways to connect and discipline children should be adapted to allow both child and parent to create a level of understanding. As we immerse into the depth of restrictive parenting and how it affects the bond between parents and their children, there is a particular parenting style that we as researchers have focused on. As studied, helicopter parenting has a negative impact on parent-child bond due to how emotionally and mentally demanding it is on the child.

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Retail Pharmacy Conditions in Central Alabama

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Abstract

INTRO: Retail pharmacies are a major part of the healthcare system. However, with an increased number of retail pharmacy closures and overall increasing dissatisfaction with the career, research exploring work conditions is warranted. Many pharmacy employees report unfavorable conditions, including the lack of designated lunch breaks, long work hours, and the inadequate number of staff and space. The purpose of this research is to investigate pharmacy employee working conditioning throughout the Central Alabama regions. METHODS: Participants were asked to respond to a series of survey questions to describe their demographics and workplace satisfaction. RESULTS: A total of 14 responses were submitted. The jobs ranged from Pharmacist, Pharmacy Interns, Pharmacy Technicians, and Clerks. Of which, 12 respondents classify as White, 1 person classifying as Asian, and 1 person identifying as biracial-White and Asian. A total of 9 participants were women and 5 men. From work related questions, 92.8% of those answers confirmed feeling any level of stress and a total of 57.1% of respondents agreed to the job affecting their mental health negatively. DISCUSSION: These data demonstrate that there is are work place satisfaction issues within the retail pharmacy industry in Central Alabama. Moreover, there was a lack of overall racial and ethnic representation across the board of job titles within the retail pharmacy itself. Future directions should have a larger participant pool and create a clear difference between those of chain pharmacies and independent pharmacies.

Introduction

Retail pharmacies are an incredibly-important part of the world of healthcare. Berenbrok et al. (2022) stated that – for many people – pharmacies are the first stop before going to a doctor's office but also afterwards. Recently, specifically after the COVID-19 pandemic, there has been a rise in services provided by pharmacies. Community pharmacies have become a key point for COVID-19 testing and vaccination success (Berenbrok et al., 2022). However, there is still much to understand about the retail pharmacy industry. According to Crouch (2024), "the Social Security Act does not federally recognize pharmacists as healthcare providers". This is despite the positive impact that community pharmacists have had after the pandemic and for patients who find it easier to find care there than at a doctor's office.

According to a study conducted by Vallient et al. (2022), pharmacists are considered the most accessible health care provider; finding 11.4% of their participants opted to go to a pharmacy rather than visit a doctor's office. This is despite the idea that pharmacists are not federally recognized. In another article from the Center for Disease Control, community pharmacies were recognized as "essential contributors" to healthcare and how they played key roles during the fight against the COVID-19 pandemic (2020). Pharmacies were dispensing the general public's medications and also became a location for vaccinations, COVID testing, and became a place where many people came to receive support for how to take care of themselves as they got through the disease (Strand, 2020). Additionally, pharmacies are accessible to people of lower socioeconomic status and predominately diverse racial population (Qato et al., 2017; Strand et al., 2020). Another study in Nebraska found that COVID-19 created a large psychological burden for pharmacists as pharmacies quickly adapted to be better accommodated

to deal with the pandemic (Gadgil et al., 2024). As Crouch stated, "the role of the pharmacist is expanding" (2024).

Recently, the increased volume in prescriptions, vaccination, long hours of working, and lack of staffing has led to many negative results in the industry. Chappell (2023) described pharmacist walkouts in Kansas at CVS and Walgreens pharmacies that led to over a dozen stores closing. Many contributing factors include high prescription volumes, high vaccination goals, long hours of which 9 of 10 times are spent standing for 12 continuous hours, as well as lack of staffing and obsolete lunch breaks. In a study from England, many of the pharmacists that participated expressed that major stressors were the heavy workload and long work hours (Jacobs et al., 2014). These conditions have made it frustrating for many to continue working; not to mention, affect their mental health (Ta, 2024). Mental health is a common reason for many people turning away from this job field. It was reported by the American Pharmacists Association that the suicide rate amongst the pharmacists in the United States is about 20 in each 100,000 people, this is higher than the statistic of the public which sits at 12 per 100,000 (2023).

Should no changes be made to the industry, the world of healthcare could have a significant issue. Berenbrok et al. warned of an expected shortage of physicians in the next decade (2022). The American Pharmacist Association reported a decline in pharmacy student outlook of the profession. In 2014, 18.2% of students indicated that they regretted their choice in career. In 2021, that statistic rose to 27.8%. This indicates a clear issue in the industry, which may require advocacy and reworking systemic issues (Chappell, 2023).

With these increases in negative tensions in community pharmacies, ultimately it will be the patients that will be at a greater risk. With no change, there is an increase in the possibility that someone who comes to pick up their medication is hurt due to the overworked and burnt-out

staff. The acts of protest performed by pharmacists and pharmacy staff are based on the need for a change in the industry to keep the safety and high-quality control of drug dispensing at its best (August 2024). When burnt-out pharmacy staff are made to continue to work, there is then an increase in the number of medication errors (Ta, 2024).

Retail pharmacy and community pharmacy are mostly used interchangeably to describe any drugstore location where it is easily accessible for the community to speak with the pharmacist and discuss any instructions and drug interactions (Smith, 2023).

There is a lack of research across the United States and a limited number of international articles regarding work place satisfaction in pharmacist. As such, this study is adapted from a study in Canada conducted by Tsao et al. (2020) in which pharmacists in different areas of the country were asked about their perspective on their workplace. The purpose of this study was to obtain the demographic and statistical information most accurately for the Central Alabama region in order compare pharmacy staff experiences from the known information and the learned information.

Methods

Participants were invited to participate via email, in-person flyers, and referrals. Requirements to participate in the study included being above 18 years old and having experience working in a retail pharmacy. There was no specification on how long a person had to work at a place or their job title. It was highly encouraged that all staff participate in the study. The data was collected through an online survey provided to the respondents.

Many of the respondents came from the North Central region of Alabama with an obvious few from the Central Birmingham region. Results were collected from June 15th until

June 17th, 2024. Many of the questions on this survey were adapted from the survey conducted in the five Canadian provinces (Tsao et al., 2020). All questions on the survey applied to every community pharmacy, regardless of whether it was independent or chain, which was approached about participation in the study. Microsoft Forms was used as the survey tool

The survey consisted of a total of 37 questions excluding the consent form. Fourteen questions were specifically dedicated to demographics. These questions include basic questions age, gender, race, ethnicity, marital status, and dependency status. There were also topic-specific questions such as job role (both current and any other) and the zip code of where they lived and worked, as well as years of experience in both field and current job title (**Table 1.**). Workplace satisfaction data was collected with a total of 23 questions. Examples of these questions included annual income, average daily prescription rate, and how long their work week by hour. A variation of 5-point and 7-point Likert scales were used to assess various responses. A total of 11 statements were provided and respondents were asked to rate their agreement via "strong disagree" all the way through to "strongly agree." Other answer choices included "all of the time" through "none of the time." Respondents were also asked to rate their job satisfaction, work-life balance, and mental health.

Table 1. Demographic questions from survey.

What is your age?
What racial group would you most closely identify with?
What ethnic group do you most closely identify with?
What gender do you most closely identify with?
What is the zip code of where you work?
What is the zip code of where you live?
What is your highest level of education?
Please mark all of the languages you can FLUENTLY speak
What is your marital status?
How many dependents live in your home?
What is your job role? (Pharmacist, Pharmacy Technician, Pharmacy Clerk, etc...)
Have you ever had a different job role? (Pharmacist, Pharmacy Technician, Pharmacy Clerk, etc...)
How many years of experience do you have in the profession?
How many years of experience in your present job role?

The input provided was then automatically generated into charts and graphs via the survey's software and converted into a spreadsheet to access all answers more easily in one place at the same time. Other methods, such as answers provided to Likert scale questions, were averaged to gain an overall idea of what each person's perceptions.

Results

A total of 14 retail pharmacy staff members from various cities participated. Women accounted for 64.2% of the respondents (n = 9) while 35.7% were men (n = 5). The answers to the demographic questions are all presented in Table 2.

**Table 2**. Demographic results from the survey (n = 14).

Category	Subcategory	Number of Respondents
RACE	White	12
	Asian	1
	White/Asian	1
ETHNIC	Non-Latinx/Hispanic	10
	White	2
	Prefer not to answer	2
GENDER	Men	5
	Women	9
HIGHEST LEVEL OF EDUCATION	Highschool	3
	Bachelors	5
	PharmD	5
	Masters	1
LANGUAGE	English	14
MARITAL STATUS	Married	10
	Single	4
DEPENDENTS	Three	1
	Two	1
	One	2
	Zero	10
CURRENT JOB ROLE	Pharmacist	3
	Pharmacy Intern	1
	Pharmacy Technician	6
	Pharmacy Clerk/Cashier	4

It is interesting to note that there is a lack of underrepresented groups with 12 out of 14 respondents identifying as White, 1 identifying as both Asian and White: the last respondent being Asian. 4 of our respondents being pharmacists, 3 pharmacy school interns, 6 being pharmacy technicians, and one cashier. The total age range being from 19 years old all the way up to the oldest respondent being 62 and the median age of 29.5 years old. There is a diverse

range of years of experience for our participants as well. In Table 3, we see that there is a wide range of experience in the field overall starting from only 2 months of experience all the way up to 40 years of experience.

The average rating of pharmacy staff's perception about their job satisfaction is a 6 with the scale being from 1 through 10. What we find is that most of our participants (n = 11) rated their satisfaction with the job at 6 or above. It is important to note that there are also some discrepancies with yearly income as most of the participants reported earning less than $100,000 USD in a year (Figure 1). This encompasses the many different job types in the retail pharmacy setting. The drastic difference in income between most of the participants as opposed to others is something to note. One participant reported earning $650,000 dollars yearly in income having 40 years of experience as opposed to our other pharmacists who at most have earned $170,000 dollars yearly with an experience of 10 years in the field.

*Figure 1:* Annual income of all retail pharmacy staff respondents.
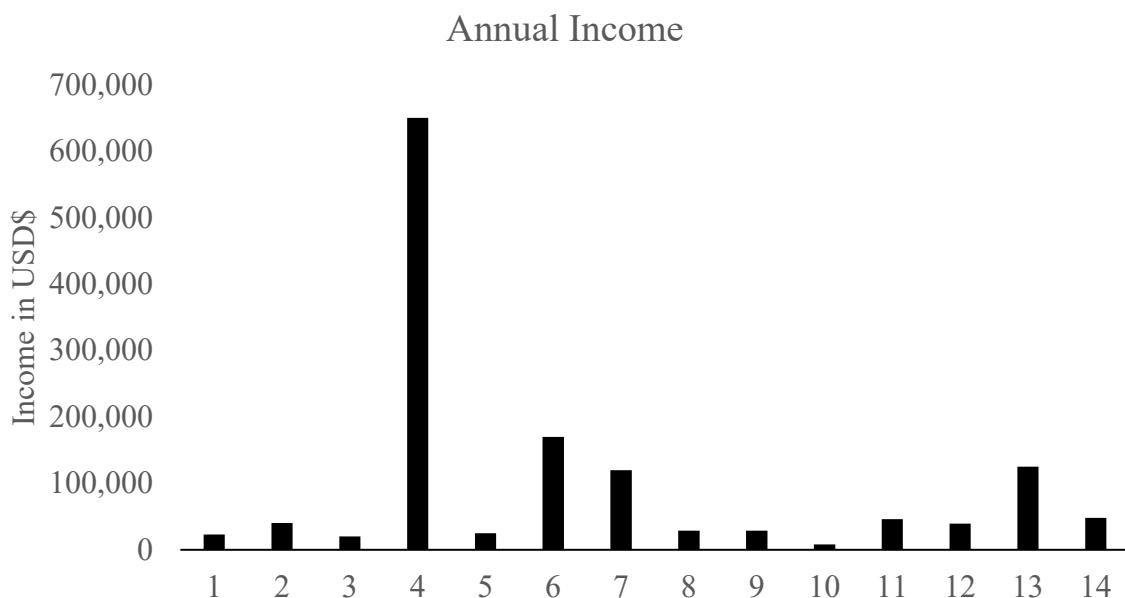
As formally mentioned, in Ta's (2024) report 79 percent of the pharmacists that were surveyed by the Canadian Pharmacy Association had reported a negative response in their mental health due to their job's workload. This in turn had a similar consensus with the Central Alabama region as an overwhelming majority of the retail pharmacy staff agreed to a negative effect on their own mental health. When asked about their job's effect on their physical health, 50% of pharmacy staff agreed to a negative strain on their physical wellbeing. On top of which, in the Canadian study, 48.3% of pharmacists that participated disagreed to having enough time for a lunch break (Tsao et al., 2020). In our study, 57.1% of retail pharmacy staff disagreed to having a lunch break, 28.6% stated that they do have a scheduled lunch break, and 14.2% stated that though they do have a scheduled lunch break, they must continue to work or they choose not to take it.

Though when asked to rate their work-life balance, community pharmacy staff rated it about a 7 as 57.1% of respondents agreed that they have time not only for themselves outside of work but also time for their families. This is despite the idea that the average time that it takes for each staff member to get to work is about 33 minutes, with 28.5% of staff answering that they take 1 hour worth of commute to get to work and to return home afterwards; 14.3% reported an average of 40 minutes, 14.2% of staff reported 30 minutes, 21.4% stated a range between 15 to 25 minutes, and for 21.4% of staff it takes them an average of 10 minutes.

In Tsao et al., 33.7% of pharmacists disagreed with the statement that states that they have enough pharmacists to provide enough patient care. Another 30.3% disagreed that they had enough clerk staffing (2020). However, when compared to the results we received from our own study, we see some interesting differences and similarities in results. Per the Central Alabama retail pharmacy staff that agreed to answer the survey, 57.1% of staff agreed that there is enough

pharmacy staff with 42.9% disagreeing. In contrast, 42.9% of staff disagreed with having enough

clerk staff for the work, while only 42.8% agreed and another 14.3% felt neutral on the subject

(Figure 2).

Figure 3: Statements 8-9 adapted from Tsao et al.'s "common working conditions" questions.

% Respondent Agreement with Working Conditions Questions
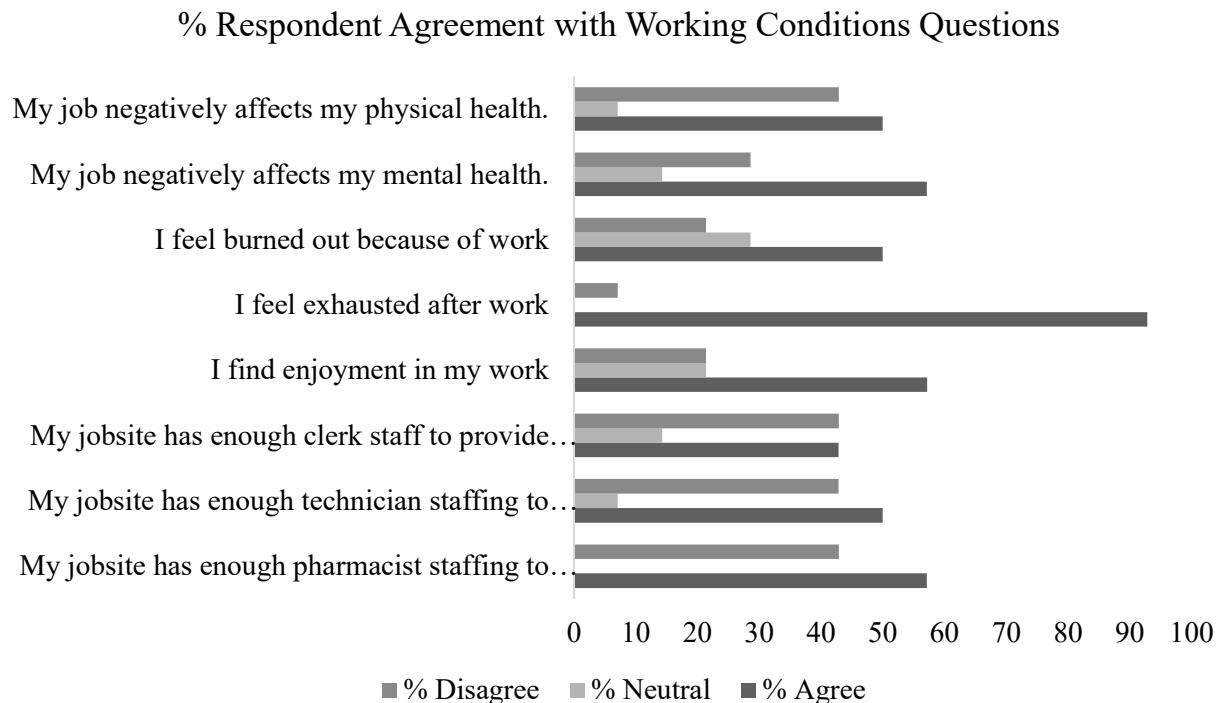
Discussion

While Tsao et al.'s (2020) study found a poor perception of working conditions in

pharmacy amongst their respondents, and Chappell talked about the unsafe and stressful working

conditions causing many pharmacists across CVS stores to walk out (2023). The overall results

in this study show that retail pharmacy staff are not necessarily dissatisfied with their working

conditions. Despite the working conditions causing effects such as burnout, exhaustion and a

negative toll on their physical and emotional health, staff still rated their job satisfaction levels at

an average of 6 and their satisfaction with their work-life balance at 7. They agree to having

enough pharmacist and pharmacy technician staffing and yet disagree about having enough clerical staffing.

Limitations

This study has a few limitations that should be noted. First, there is a small sample size of participants that gave us their input and time in answering the survey. It is therefore not plausible to generalize all the community pharmacy staff in the Central Alabama region. Secondly, there is an overall lack of ethnic and racial representation in our sample population. Future directions should assess these issues with a much larger cultural pool as it may prove to be much more useful to provide more insight into any differences or similarities present within the subject of the study itself. Additionally, this study was specific to the Central Alabama region, more specifically, retail pharmacies in the region. This means that there is no clear difference between the independent pharmacies and chain pharmacies that were approached. This leans into the next limitation, a lack of retail pharmacy type questions. Moreover, this study could be spread to retail pharmacies across a wider region or even expanded to the other disciplines in pharmacy outside of community pharmacy.

Conclusion

The community pharmacy staff that participated in this study reported a moderate satisfaction with their job and a moderate satisfaction with their work-life balance. Inconsistencies with their satisfaction and overall mental and physical well-being were recorded as well as an agreement to the lack of time to have a scheduled lunch break. Considering that retail pharmacies are an integral part of our healthcare world and were incredibly important during the COVID-19 pandemic, there is a necessity to make working conditions much better

and to level the playing field between pharmacy staff and other branches of the public health

system.

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