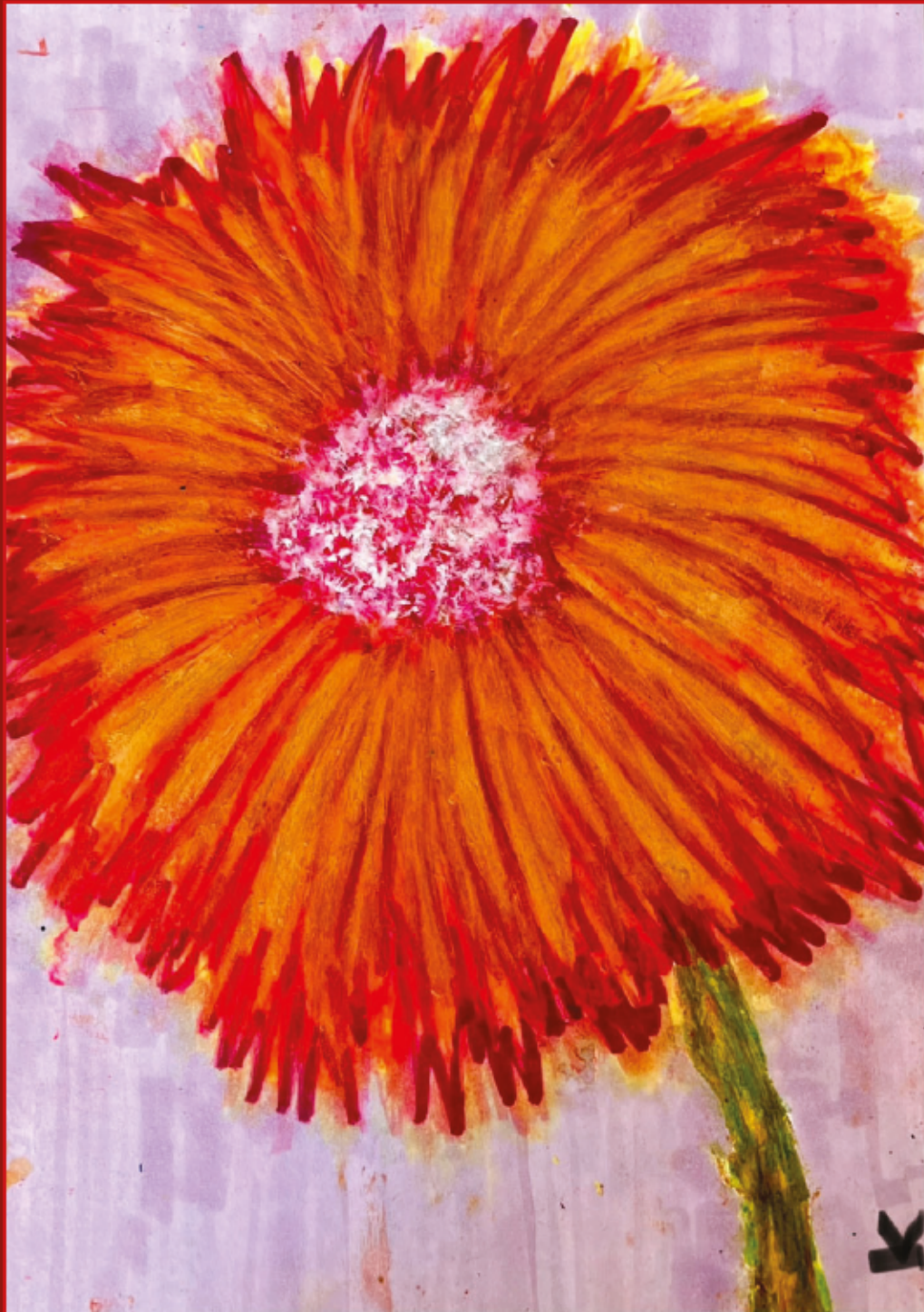


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ADELANTE



A JOURNAL OF STUDENT RESEARCH AND CREATIVE WORK

¡El querer es poder!
Where there's a will,
there's a way!

Adelante: A Journal of Student Research and Creative Work

Volume 3: Fall 2023

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Photo Credit: California State University, Chico

We acknowledge and are mindful that Chico State stands on lands that were originally occupied by the first people of this area, the Mechoopda, and we recognize their distinctive spiritual relationship with this land, the flora, the fauna, and the waters that run through campus.

We are humbled that our campus resides upon sacred lands that since time immemorial have sustained the Mechoopda people and continue to do so today.

From the Editor Alondra Adame



I am fortunate to be able to return to Adelante after earning my master's degree in English from Chico State and even having the opportunity to teach as a lecturer for a short while! My own learning experiences and teaching experiences have only reinforced how much I believe the Adelante program is an amazing resource for our students. The journal is only one of the many opportunities that provide Chico State students with an enriching experience that supports their academic journey and helps them gain confidence and pride in their work. I hope this third issue can function as a testament to Adelante's impressive growth over the years.

The papers and abstracts being presented in this journal are teeming with talent, hard work, and passion for the various subjects that these students have thrown themselves into. It is so important to provide research opportunities for students to explore and learn more about themselves as academics.

I hope when readers spend time with the work featured in this journal that they will imagine these students working in the various places that this important intellectual work often happens: in the offices of supportive and compassionate faculty mentors, in dorm rooms and apartments, at their work desks during their breaks, in the corners of Meriam Library, in the front seats of their cars before class, and so many other small nooks and crannies of their lives. Busy students take what they can get and they make it work in the most amazing of ways. This journal and the work I've put into it are meant to highlight these noble efforts. I thank every contributor for their final products but also all of the energy, sweat, and tears that have undoubtedly gone behind them.

To the Adelante crew, to the student contributors, to the faculty mentors, and to anyone who will step forward in the future, please continue to do the work that matters to you. It matters to me and I am certain that it matters to others but what matters most is that you care about it with all your heart. Vale la pena.

Alondra Adame

Origins

The goal of *Adelante**: *A Journal of Student Research and Creative Work* is to showcase the breadth and diversity of Chico State undergraduate and graduate student research and creative work.

The idea for the journal grew out of our desire to provide examples of student work that demonstrate a wide array of methods, styles, and diverse voices. We hope the journal inspires more students to engage in research and to pursue opportunities to present and publish their work in this journal and beyond.

The student journal is edited by graduate students wishing to learn about the peer review process, editing, and publishing academic research. In addition to establishing a competitive, peer-review process to select and publish a small number of high-quality, finished papers, we also wanted to include shorter pieces that allowed all student researchers to publicly share at least some part of their work.

For this reason, we encouraged students to submit abstracts that captured their research and creative work. All of our authors had an opportunity to work with us to edit and format their work.

In addition to the completed papers and abstracts, the journal includes student-author photos and biographies. We also thought it was important to recognize and highlight the faculty who provide the opportunities and mentoring necessary to ensure our students' success. We included their photos and biographies, too. Finally, we included in the journal a research and writing resource guide to share with students beginning or continuing their research journeys.

We are pleased with this third edition. We believe it once again meets our goal of showcasing our students' research and creative endeavors and the dedicated faculty who support them. In future editions, we hope to expand the journal to provide even more opportunities for students to showcase their excellent work.

—Adelante Editors

*Note: “Adelante” is Spanish for “Onward, Ahead, Forward!”

Journal funding and support is provided by the Office of Graduate Studies and Adelante: a Postbaccalaureate Pipeline program funded by the US Department of Education Developing Hispanic-Serving Institutions Title 5 grant (\$2.9 million).

The Adelante program's core mission is to support Latinx and low-income students at Chico State to explore, prepare for, apply to, and successfully attain graduate degrees and teaching credentials.

It is a multifaceted program and includes a graduate student ambassadors outreach program where information about graduate education is provided to undergraduates, a peer-plus mentoring program where graduate students mentor undergraduates, and a summer research program that pairs undergraduate and graduate students with faculty mentors to conduct research.

Cover Art and Designer



About the Artist

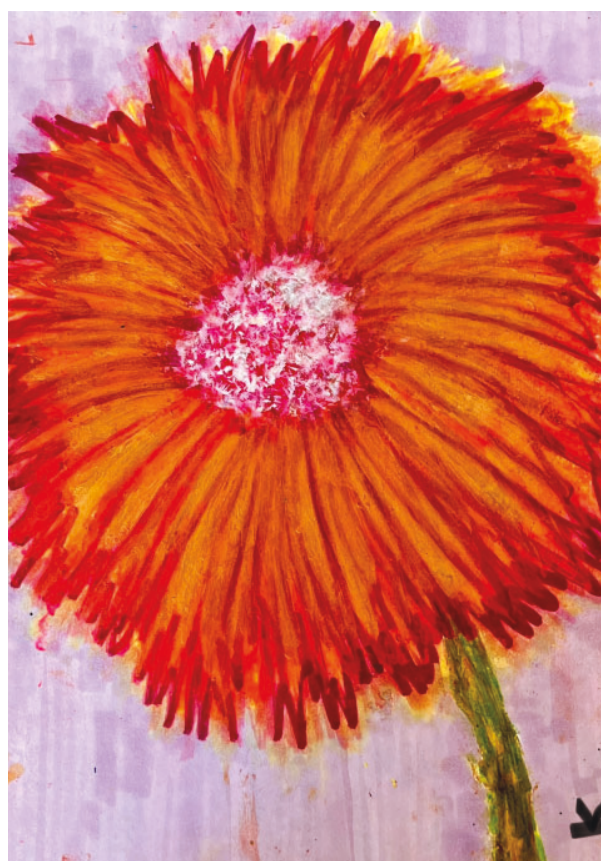
I am Karen Ortiz, and I am extremely grateful to have had the opportunity to explore the subjects of comparative religion and humanities with a wonderful group of faculty and fellow peers. Together we immersed ourselves into understanding the many worldviews and the importance of respecting our differences.

I am so excited to have started my academic journey in 1988 as a fashion design student in a different space and time. The most amazing thing is that at the end of 2024 I am completing a Bachelor of Arts in Religious Studies with a minor in Humanities. My interests revolve around global wellbeing and the development of meaningful relationships through dialogue that involves peacebuilding and conflict resolution. I also create art, and I am thrilled to share it with Adelante and the Chico State academic community.

My background in art is inspired by a combination of urban city culture and my

own personal connection with ancestral roots that I reimagine. While living on ancestral Ramaytush Ohlone land in San Francisco I have been infused by the visual essence of the coastal Pacific waters that surround it.

My current artwork focuses on the expression of the spiritual and the relationship with the environment. In my artwork I use textile and mixed media art while exploring the internal dialogue and the process of interpreting nature.



Karen Ortiz

Sunny loves Wind

Acrylic paint, marker, pencil on mixed media paper, 7 x 10 in

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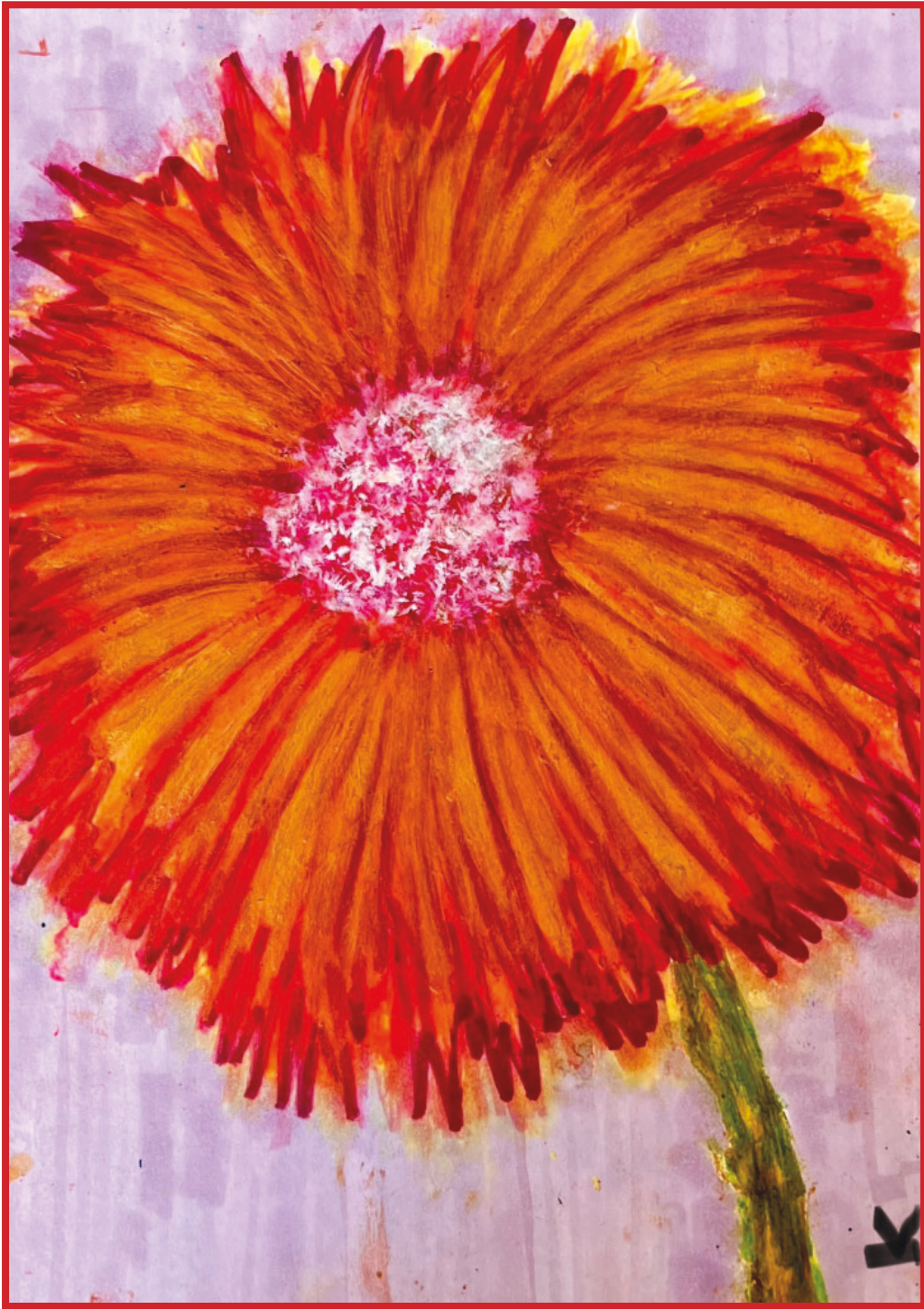
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STUDENT PAPERS

This is a paper written by a Master of Social Work student. Their faculty mentor was Professor Susan Roll. Though formatted slightly differently for this journal, the style guide used for this paper was the Publication Manual of the American Psychological Association (APA), which is typical of papers in this discipline and used in-text citations.

CHILD WELFARE SOCIAL WORKER RETENTION: THE RELATIONSHIP OF SECONDARY TRAUMA AND PANDEMIC STRESSORS

Christopher Robinson

Abstract

The current study was designed to investigate the relationship between retention, secondary trauma, and pandemic stressors for child welfare social workers that provide direct service to children and families. Using a combination of the Comprehensive Organizational Health Assessment and COVID-19 Stressor Scale, the study utilizes a quantitative survey distributed to social workers of four public child welfare agencies in the Northern and Mountain Valley regions of California. Although the results showed no significant relationship between retention and the other variables, this study is the first to find a significant positive correlation between secondary trauma and pandemic stressors. This new finding suggests that child welfare social workers, and potentially others that are commonly impacted by secondary trauma, may be vulnerable to higher rates of pandemic stress. Due to this finding, the current study recommends that child welfare agencies develop emergency response policies specifically designed to support staff with pandemic stress. Further research to understand the directionality of the relationship between pandemic stress and secondary trauma is also recommended. Finally, due to challenges with locating aggregate retention data for the participating agencies, the study also recommends that retention is measured and monitored at the state level to ensure consistent and accurate measurement across the state.

Introduction

Public child welfare agencies face many hardships providing effective and productive services to their communities. One of the most long standing and difficult issues to solve has been social worker retention. Despite recent retention efforts, public child welfare agencies are losing employees at up to four times the rate of a typical healthy organization (Casey Family Programs, 2017). The cost of this turnover is great including the increased spending on recruitment and training, stress on remaining employees, and a significant impact on reunification outcomes for families. There are many factors that impact a family's reunification outcomes such as participation, mental health, and substance abuse (D'Andrade & Chambers,

2012). However, there is one key factor that the family has very little control over, changes in their social worker. Ryan et al. (2006) found that social worker turnover was related to increased lengths of stay in foster care and a significant decrease in the likelihood of achieving reunification. This suggests that families are being permanently separated due to agencies' inability to maintain a stable and skilled workforce.

Many agencies and states have enacted programs to address retention in child welfare. The Title IV-E program, for example, provides subsidized education to social work students at the bachelor and master levels in exchange for committing to public child welfare work after graduation. This program has shown to significantly increase retention, specifically

during the commitment period, and provides further education which is a key factor in retention (Rosenthal & Waters, 2006). Despite this program's relative success, overall agency retention rates have remained similarly low. De Guzman et al. (2020) found that employee's intent to stay was negatively impacted by a lack of agency support, lack of peer support, and a feeling of incompetency at the job. This suggests a need for agencies to adopt a more supportive agency culture in which employees feel comfortable seeking professional development and process their perceived shortcomings.

One of the key factors for child welfare social worker retention is the impact of secondary trauma. Secondary trauma, the effect of exposure to the trauma and suffering of others, is a harsh reality for many social workers. Social workers in public child welfare agencies witness traumatic events during the removal of children, family interviews, and through the often-graphic reports of abuse and neglect. Lipsky and Burk (2009) explain secondary trauma as an "osmosis" of tragedy and suffering that become a part of the worker and ultimately, change their view of the world. Secondary trauma accumulates over time with each new trauma witnessed and when past traumas are remembered. Child welfare social workers experience abnormally high levels of secondary trauma with 29.6% scoring in the "severe" range (Rienks, 2020). The impact of this may include hyperarousal, avoidance, re-experiencing events, fatigue, confusion, and even feeling hopelessness (Casey Family Programs, 2017). Many of these symptoms have been noted by Casey Family Programs (2017) to be predictors of turnover in child welfare social workers. Without direct agency interventions to support social worker processing, resiliency, and destigmatizing of secondary trauma it will continue to have a significant effect on the majority of social workers in child welfare (Tullberg & Boothe, 2019).

The coronavirus (COVID-19) pandemic has introduced a lot of stress and anxiety across the

globe. Child welfare social workers are not immune to the fear of infection, fear of socioeconomic impacts, anxiety about infecting loved ones or clients, or logistical stressors such as childcare and self-care during lockdowns. Rienks (2020) identified having a clear self-care plan, participating in activities or hobbies, and having a work-to-home transition plan were the most common coping strategies among successful copers. However, for many, self-care plans and hobbies were disrupted by the fear of infection and lockdowns. Further, working from home disrupted the work-to-home transition plan many utilized. With increased stress, anxiety, and the disruption of typical coping strategies, child welfare social workers are likely more vulnerable to secondary trauma during the pandemic, however, prior to the current study there was no research on this connection. This suggests that agency support and interventions are even more crucial while facing crises such as COVID-19.

This study hypothesized that public child welfare agencies with social workers reporting low intent to stay would have higher secondary trauma rates and increased impact of pandemic stressors. This study's secondary hypothesis was a positive correlation between secondary trauma and pandemic stressors. This quantitative approach aimed to gather the intent to stay of social workers in participating public child welfare agencies across the Northern and Mountain Valley regions of California. Additionally, surveys measuring secondary trauma, pandemic stressors, support culture in the agency, and other measures of organizational health were distributed to the agency social workers. Findings from this study provide insight directly to the participating county agencies and field of child welfare on the effect of secondary trauma and pandemic stressors on their employees. An in-depth literature review found no evidence of a correlation between secondary trauma and pandemic stressors making this study the first to identify a relationship between these variables.

Literature Review

Retention

Retention, the ability for an agency to maintain its employees, is a consistent issue for many child welfare agencies across the U.S. Retention rates for public child welfare agencies across the country average between 80 – 60 percent with California averaging around 39 percent (Casey Family Programs, 2017). Kim and Kao (2014) found that on average, 7 to 10 percent of child welfare positions are vacant at any one time. This inability to maintain a stable workforce has severe consequences for the employees, the agency, and the families that they serve. Further, they found that high vacancy rates and vacant positions were taking an average of seven to thirteen weeks to fill, with remaining employees being left with dangerously high caseloads.

These increased caseloads cause emotional exhaustion, lack of supervisory/administrative support, and increase the likelihood of remaining employees terminating their employment (Kim & Kao, 2014). Low retention rates have a major cost for the agency as well. Filling a vacant position and training a new employee can cost between 1/3 to 2/3 of the employee's annual salary and agencies with lower retention rates are less compliant with mandated service requirements (Social Work Policy Institute, 2010). With the average tenure of child welfare social workers being less than two years, families often have multiple social workers throughout their case. Each social worker change reduces the likelihood of reunification, increases the length of stay in foster care for the children, and increases foster care placements (Ryan et al., 2006; Social Work Policy Institute, 2010).

Unfortunately, for child welfare agencies across the country, increasing retention rates is not a simple feat. According to Casey Family Programs (2017) and Kim and Kao, (2014), there are many factors with varying levels of effect on retention. Employee demographic factors

such as race, gender, education, and age have a low to moderate effect. Agency climate factors such as inclusion, organization/supervisory support, policy, and organizational commitment have a medium to high effect. The greatest average effect are employee stress factors such as emotional exhaustion, job satisfaction, well-being, safety concerns, role conflict, and coping (Casey Family Programs, 2017; Kim & Kao, 2014). De Guzman and authors (2020) found that not only did self-reported intent to stay predict actual retention rates, but that organizational/peer supports were key predictors of intent to stay for child welfare social workers. This suggests that agencies may have some success increasing retention rates by implementing research and changes to their support policies (de Guzman et al., 2020). Further, Rosenthal and Waters (2006) found that funded social work education programs can be powerful incentives to increase retention while developing education in their workforce. One such program, Title IV-E, funds child welfare social workers to gain social work degrees and in return requires an employment commitment.

For every year an employee receives funding they are obligated to maintain employment for a year after graduation. During this employment period, the risk of termination decreased by 52% (Rosenthal & Waters, 2006). Although there are some successful interventions for increasing retention, there is still much research needed to address this issue. One factor that is often overlooked in previous research is child welfare social worker's high level of exposure to trauma and the resulting impacts of secondary trauma.

Secondary Trauma

Secondary trauma, particularly for child welfare social workers, is the indirect exposure of trauma at work. Through working in a trauma-adjacent field, engaging in trauma related discussion with clients, and reading various reports on traumatic events, child welfare social workers are regularly exposed to the trauma

of others (Tullberg & Booth, 2019; Lipsky & Burk, 2009). Tullberg and Booth (2019) found that secondary trauma, or secondary traumatic stress, has been included in more broad terms such as compassion fatigue, vicarious trauma, and burnout. Unfortunately, the similarity across these terms has created some incoherence in the research. Focusing solely on secondary trauma allows researchers to measure its effect more directly rather than including it in a larger measure of a broader issue. In 2016, Potter et al. (2016) created the Comprehensive Organizational Health Assessment (COHA) which included multiple scales adapted from previous research as well as novel scales for coping strategies, agency supports, secondary trauma, and more. Through multiple studies, the COHA has shown to be successful in providing agencies with a comprehensive understanding for future development, but also provide powerful and actionable results for individual scales (Rienks, 2020; Potter et al., 2016; Sedivy et al., 2020).

Rienks (2020) found that child welfare social workers had high levels of secondary trauma, with 29.6% of their sample scoring in the “severe” range and 27.3% scoring in the “moderate to high” range. These high rates are not surprising, as most child welfare cases begin after a traumatic event, lead to detention which is often traumatic, and can result in a traumatizing failure to reunify. Not to mention the events that often occur throughout the case such as placement changes, separating sibling groups, court hearings, and more. Symptoms of secondary trauma include helpless/hopelessness, feeling incompetent or ineffective, hypervigilance, lack of creativity, struggling with complexity, minimizing, chronic exhaustion, physical ailments, dissociative moments, avoidance, feeling persecuted, guilt, fear, anger, cynicism, numbness, grandiosity, and even addiction (Lipsky & Burk, 2009). These many symptoms make it more difficult for child welfare social workers to be effective, proud, or present at their jobs. Without appropriate coping mechanisms or agency support, it is clear how the exposure to secondary

trauma would cause so many child welfare social workers to leave their positions. Although there is no way for child welfare social workers to avoid secondary trauma completely, there are ways to successfully cope and manage the exposure to other’s trauma. Newell and MacNeil (2010), and Tullberg and Booth (2019) found that social workers who demonstrate the healthiest coping skills and least secondary trauma symptoms have a clear self-care plan. The best self-care plans involve both physical and emotional well-being. Exercise, nutrition, and adequate sleep are powerful coping strategies for social workers’ physical health. For emotional well-being, creativity, spirituality, and social support from friends or professionals are often utilized (Newell & MacNeil, 2010; Tullberg & Booth, 2019). Tullberg and Booth (2019) found that social workers that utilized a self-care plan were more likely to maintain their coping skills over a three-year period and showed reduced secondary trauma symptoms throughout the study. However, due to crises such as COVID-19 pandemic, even the best coping social workers could have a significant disruption in their normal self-care plan along with an increase in external stress and anxiety which could increase vulnerability to secondary trauma.

Pandemic Stressors

The COVID-19 pandemic presented challenges for most people, but it had a particular impact on child welfare social workers. In a recent study utilizing the COVID-19 Stressors Scale (CSS), Americans were found to have high levels of stress exposure with specific populations being especially vulnerable (Park et al., 2020). In a study of almost 2000 child welfare social workers, 46.4% reported experiencing mild or severe distress suggesting that this population is particularly affected by pandemic stressors (Miller et al., 2020). Following a study demonstrating the validity of the CSS, Russel and researchers (2021) expanded the measure to identify family routine stressors. This study found that, during the COVID-19

pandemic, parent resilience was linked to familial stress, caregiver burden, and parent-child relationship quality (Russel et al., 2021; Tambling et al., 2021). These findings suggest that caregivers are particularly vulnerable during crises such as the COVID-19 pandemic and that parent experiences of pandemic stressors are likely to impact relational health of the family.

Pandemic stress can come in many forms and impact the whole life of a child welfare social worker. For example, in a national survey of 1500 U.S. adults, 12.1% reported personally knowing somebody who passed away from COVID-19 (Palsson et al., 2020). While 77.6% child welfare professionals (attorneys, social workers, and therapists) in a recent study reported increased fear about the safety of the families and children they work with as well as 55.1% reporting increased worry about their own safety (Goldberg et al., 2021). Further, 83% of participants in a U.S. national survey reported staying at home for several weeks due to the pandemic (Palsson et al., 2020). This has clear implications for social workers' self-care plans, many of which include support from friends and activities outside of the home (Rienks, 2020).

An increase in social media use, to remain in contact with loved ones and stay informed on the pandemic, is common during the pandemic. However, Zhong and authors (2021) found that increased social media usage at this time was related to both depression and secondary trauma. This suggests that finding support from family and friends, a key coping strategy for secondary trauma, is not as effective through social media and can actually become harmful (Rienks, 2020; Zhong et al., 2021).

Large scale pandemics, such as COVID-19, also impact the financial stability of families. For example, 38% of adults reported having reduced income or losing a job in their household due to the COVID-19 pandemic. While 25.5% of child welfare professionals reported experiencing other stressors in their job such

as adapting to new technology, increased work demands, lack of boundaries between personal and professional life, decreased sense of mastery at one's job, and deteriorating mental health (Goldberg et al., 2021). Overall, 55% of survey participants reported experiencing more life stress during the pandemic with 23% reporting "much greater" stress (Palsson et al., 2020). Child welfare social workers face a great deal of stress at their positions during normal circumstances, the many added pandemic stressors will likely lead to unprecedented levels of secondary trauma and ultimately reduce retention rates in child welfare agencies.

Methodology

The current study utilized a quantitative design to examine the relationship between the following variables: secondary trauma, pandemic stressors, and social worker intent to stay. The first hypothesis suggested that public child welfare agencies with social workers reporting low intent to stay (dependent variable) would have higher secondary trauma rates and increased impact of pandemic stressors (independent variables). Further, the study also hypothesized that there would be a significant relationship between secondary trauma and pandemic stressors such that increased secondary trauma scores would be correlated with increased pandemic stress scores. Agencies were recruited from the Northern and Mountain Valley Regions of California (see Appendix A) to ensure accessibility and comparability of the agencies. Prior to the data collection stage of this study, the California State University, Chico Internal Review Board completed a full board review and approved the study.

Population and Sample

Utilizing purposive and self-selection sampling methods, county child welfare agencies were recruited to participate in the study at the University of California Davis facilitated Program Manager Meetings and Director Meetings for

the Northern and Mountain Valley Regions of California (see Appendix A). These agencies were provided information on the data collection process, survey domains, potential risks and benefits, and timeline for data collection and analysis. From these participating agencies, participants were recruited utilizing a self-selection sampling method through email, staff meeting, recruitment flier, and an one-hour information session in-person and via Zoom virtual meetings with the head researcher. Inclusion criteria for participation included currently holding a direct service social work position in a participating agency and being at least 18 years old. Staff were excluded from participating if they were not currently employed at a participating Northern or Mountain Valley region child welfare agency, had any previous knowledge of the survey that would bias their data collection, or if they currently held administrative, supervisory, or aide roles.

A total of 54 respondents participated in the survey. Twenty respondents were removed from the data pool due to incomplete survey responses. Seven respondents were removed from the data pool due to currently holding positions in their agency which did not meet the inclusion criteria (non-supervisory, direct service providing social workers). Of these seven, two were in a supervisory role, one was in a support staff role, and four reported being in roles that did not provide direct services such as court workers or family finding workers. The remaining 27 participants met the inclusion criteria and completed the survey in its entirety.

Findings and Results

This study hypothesized that public child welfare agencies with social workers reporting low intent to stay would have higher secondary trauma rates and increased impact of pandemic stressors. Results from the data collected indicated no significant finding. The study's secondary hypothesis was there would be a positive correlation between secondary trauma and pandemic

stressors. As seen in Table 2, the relationship between secondary traumatic stress (as measured by the COHA) and pandemic stressors (as measured by the CSS) was investigated using Pearson product-moment correlation coefficient via IBM Statistical Package for the Social Sciences.

Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a medium correlation between the two variables, such that $r = .446$, $n = 27$, $p < .02$, with high levels of secondary traumatic stress associated with high levels of pandemic stressors. Cronbach's alpha was calculated to ensure reliability of the variable measures.

Discussion of the Findings

The current study was designed to test the hypotheses that retention would be mediated by secondary trauma and pandemic stressors, and that secondary trauma and pandemic stressors will have a positive correlation. Contrary to the primary hypothesis, there was no significant relationship between intent to stay and the independent variables of secondary trauma and pandemic stressors. This finding suggests that secondary trauma and pandemic stressors have no impact on retention or intent to stay. With previous literature finding a relationship between secondary trauma and retention (Rienks, 2020 & Rosenthal, 2006), it is likely that including pandemic stressors led to the lack of significant relationship. This may be interpreted as pandemic stressors having no clear impact on retention; however, it may also be that financial stressors from the COVID-19 pandemic have impacted participants differently. Some participants, facing financial instability from the pandemic, may not be able to leave their current position without having another position available. While other participants, consistent with the literature, have lower intent to stay due to the impact of secondary trauma. This combination of competing effects may account for the lack of significance with the main hypothesis. However, the

current study did provide the first significant evidence of a positive correlation between the impact of secondary trauma and pandemic stress such that increased rates of secondary trauma were consistently associated with increased rates of pandemic stress. Although correlational relationships provide no evidence of directionality, this finding suggests that child welfare social workers may be at greater risk of pandemic stress due to their high exposure to secondary trauma. With further research, this finding may be able to be expanded to other fields commonly impacted by secondary trauma such as mental health, health care, and emergency services (Mott et al., 2019, Rekiewicz et al., 2022).

Limitations of the Study

One of the major limitations of the current study was the length of the survey. In order to get buy-in from agencies, the current study utilized the full COHA and CSS which provided actionable information over multiple domains for the agency. With over 500 items included in the survey, participants completed the survey in roughly 60 - 90 minutes. Sixty-three percent of participants completed the survey in its entirety. It is possible that the social workers most impacted by secondary trauma and pandemic stress were unable to complete the survey due to having the least capacity in their schedule and energy. Further, participants with the lowest intent to stay may be less incentivized to complete the survey as they are less concerned with agency improvement if they intend to leave the agency in the near future.

In a similar vein, the agencies most impacted by low retention, high secondary trauma and high pandemic stress are also the least likely to have the capacity to engage in the study. In fact, multiple agencies originally planning to participate in the project regrettably removed themselves from participation following turnover in their staff which led them to struggle to meet the needs of their community, let alone have the capacity to participate in the research process. Limiting the scope of the project to

the Mountain Valley and Northern regions of California allowed the project to ensure accurate comparison across agencies and maintain access to agencies and participants, however, findings from these smaller rural agencies may not be applicable to larger urban agencies. This lack of generalizability continues to be a limitation with the chosen study population as well. Although other fields may be similarly impacted by secondary trauma and pandemic stress, without further research there is no evidence that the found correlation can be expanded outside of direct service child welfare social workers. With the limitations on response and completion rates, the final sample which met all inclusion criteria included 27 participants. With this small of a sample size, quantitative data becomes less accurate to the population, more impacted by outliers, and more vulnerable to confounding variables and bias. This is particularly concerning when using a self-report method, such as the current study, as self-reported data is unable to be verified and is open to a number of biases both implicit and explicit.

Finally, one of the most challenging and impactful limitations of the study was the lack of accurate aggregated retention data. Despite contacting multiple sources, including the California Department of Social Services, University of California Davis Training Academy, California Social Work Education Center, and the participating agencies themselves, the researcher was unable to locate retention data with consistent methodology and reporting periods. Fortunately for this study, the COHA included a measure of intent to stay which has already been found to accurately predict future retention (de Guzman et al., 2020). This measure of intent to stay was utilized in place of the unavailable retention data. However, the lack of literature on the variables and their impacts on staff, agencies, and child welfare involved families limits the validity, reliability, and generalizability of the current study results and utilized instruments.

Conclusions

Child welfare agencies face a number of challenges including low retention rates, high rates of secondary trauma, and most recently the unique impacts of COVID-19. The current study hypothesized that agencies with the lowest retention rates would have the highest rates of secondary trauma and pandemic stress. Further, the secondary hypothesis was a positive correlation between secondary trauma and pandemic stressors. Four child welfare agencies from the Northern and Mountain Valley regions of California participated in the project. Utilizing a voluntary non-random sampling method, direct service providing child welfare social workers from these agencies were recruited to complete a survey which included the COHA and the CSS. Following data collection, the researchers utilized correlational and multivariate analysis to test their hypotheses. Results included no relationship between intent to stay (a replacement measure for unavailable retention data) and the impacts of secondary trauma and pandemic stress. However, this study did find a significant positive correlation between secondary trauma and pandemic stress, the first evidence of a relationship between these two variables. This finding suggests that stress from the pandemic and similar crisis situations is more impactful on individuals that experience high levels of secondary trauma.

Recommendations

Given the finding of secondary trauma and pandemic stress being positively correlated, child welfare agencies with higher levels of secondary trauma should develop emergency response policies centered around supporting their staff during pandemics and similar crisis events. Further, in order to reduce the impact of low retention on family outcomes, the researcher recommends that child welfare agencies develop a policy for more healthy transitions between social workers, ideally reducing traumatic re-experiencing for the family and allowing the incoming social

worker to be better prepared to meet the family's needs. Future research is also needed to better understand the relationship between secondary trauma and pandemic stress including directionality of the relationship, expansion into other trauma-facing fields, and expansion beyond the mostly rural Mountain Valley and Northern regions of California. Further, given the current study's demographic sample being 63% White, 14.8% Hispanic and only 3.7% Black, research in other regions, states, and even countries with more diverse populations are needed, especially considering the evidence of racial differences in experiences of secondary trauma (Shell et al., 2021). Future research specific to the child welfare field may look to identify the impact of the pandemic and social worker secondary trauma on child welfare outcomes, as well.

Finally, throughout the literature review, recruitment, and data analysis the researcher identified two clear needs for the field of child welfare. First, child welfare social workers are continuing to be heavily impacted by secondary trauma suggesting a need for increased and accessible support. With this need in mind, the researcher recommends that child welfare agencies develop internship positions for Masters in Social Work and Marriage and Family Therapy students to provide on-site clinical support to staff. Accessible and free support available directly after the experience of secondary trauma may reduce the long-term impact on the social worker. This program will also allow the agency to develop connections to local universities and potentially identify new employees through the increased internship opportunities. Secondly, one of the greatest challenges of this project was the lack of aggregate retention data available not only to the public, but to the agencies themselves. With retention being a statewide issue for child welfare agencies for decades, it is clear to the researchers that developing consistent retention methodology and collecting retention data at the state level would support future research on this impactful issue and allow agencies to better understand their own reten-

tion challenges. Utilizing the current California Child Welfare Indicators Project (CCWIP) and collaboration with University of California, Berkeley, the California Department of Social Services should be able to seamlessly implement a measure methodology for retention, collect this data from each county agency in California, and present the data on the CCWIP site for agencies, researchers, and the public to utilize.

References

- Beniwal, R. (2017). Implicit bias in child welfare: Overcoming intent. *Connecticut Law Review*, 49(3), 1021–1067.
- Bride, B.E., Robinson, M.R., Yegidis, & Figley, C.R. (2004). Development and validation of the Secondary Traumatic Stress Scale. *Research on Social Work Practice*, 14, 27-35. doi: <https://doi.org/10.1177/1049731503254106>
- Bunting, L., Montgomery L., Mooney, S., MacDonald, M., Coulter, S., Hayes, D., & Davidson, G. (2019). Trauma informed child welfare systems: A rapid evidence review. *International Journal of Environmental Research and Public Health*, 16(13), 2365. <https://doi.org/10.3390/ijerph16132365>.
- Butler Institute of Families (2012). *Comprehensive Organizational Health Assessment Instrument Summary*. https://jbcc.harvard.edu/sites/default/files/theme_1.4b.coha_instruments_summary_2012.pdf
- Butler Institute for Families (2014). NCWWI COHA Intent to Stay [unpublished measure]. Denver, CO: University of Denver.
- Casanueva, C., Burfeind, C., & Tueller, S. (2016). *Patterns of foster care placement and family reunification following child maltreatment investigations*. U.S. Department of Health and Human Services, Office of Human Services Policy, Office of The Assistant Secretary for Planning and Evaluation. <https://aspe.hhs.gov/sites/default/files/private/pdf/258526/Reunification.pdf>
- Casey Family Programs. (2017). *Information packet: Healthy organizations*. https://casey-familypro-wpengine.netdna-ssl.com/media/HO_TurnoverCosts_and_Retention_Strategies.pdf
- Children’s Bureau. (2020) *How the child welfare system works*. U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children’s Bureau, Child Welfare Information Gateway. <https://www.childwelfare.gov/pubpdfs/cpswork.pdf>
- de Guzman, A., Carver-Roberts, T., Leake, R., & Rienks, S. (2020). Retention of child welfare workers: Staying strategies and supports. *Journal of Public Child Welfare*, 14(1), 60–79. <https://doi.org/10.1080/15548732.2019.1683121>
- D’Andrade, A. C., & Chambers, R. M. (2012). Parental problems, case plan requirements, and service targeting in child welfare reunification. *Children and Youth Services Review*, 34(10), 2131–2138. <https://doi.org/10.1016/j.childyouth.2012.07.008>
- Goldberg, A. E., Brodzinsky, D., Singer, J., & Crozier, P. (2021). The impact of COVID-19 on child welfare-involved families: Implications for parent–child reunification and child welfare professionals. *Developmental Child Welfare*, 3(3), 203–224. <https://doi.org/10.1177/25161032211045257>
- He, A. S., Grenier, A., & Bell, K. (2020). *Comprehensive Organizational Health Assessment public workforce excellence sites: Cross-site summary report: September 2020*. Albany, NY: National Child Welfare Workforce Institute.
- Kim, H., & Kao, D. (2014). A meta-analysis of turnover intention predictors among U.S. child welfare workers. *Children and Youth Services Review*, 47(3), 214–223. <https://doi.org/10.1016/j.childyouth.2014.09.015>
- LaBrenz, C. A., Findley, E., Graaf, G., Baiden, P., Kim, J., Choi, M. J., & Chakravarty, S. (2021). Racial/ethnic disproportional-

- ity in reunification across U.S. child welfare systems. *Child Abuse & Neglect*, 114, 104894–104894. <https://doi.org/10.1016/j.chiabu.2020.104894>
- Lipsky, L. van D., & Burk, C. (2009). *Trauma stewardship: An everyday guide to caring for self while caring for others* (1st ed.). Berrett-Koehler Publishers.
- Miller, J. J., Niu, C., & Moody, S. (2020). Child welfare workers and peritraumatic distress: The impact of COVID-19. *Children and Youth Services Review*, 119, 105508–105508. <https://doi.org/10.1016/j.childyouth.2020.105508>
- Miller, K. M., Cahn, K., & Orellana, E. R. (2012). Dynamics that contribute to racial disproportionality and disparity: Perspectives from child welfare professionals, community partners, and families. *Children and Youth Services Review*, 34(11), 2201–2207. <https://doi.org/10.1016/j.childyouth.2012.07.022>
- Mott, J., & Martin, L. A. (2019). Adverse childhood experiences, self-care, and compassion outcomes in mental health providers working with trauma. *Journal of Clinical Psychology*, 75(6), 1066–1083. <https://doi.org/10.1002/jclp.22752>
- Newell, J. M., & MacNeil, G. A. (2010). Professional burnout, vicarious trauma, secondary traumatic stress, and compassion fatigue: A review of theoretical terms, risk factors, and preventive methods for clinicians and researchers. *Best Practices in Mental Health: An International Journal*, 6(2), 57–68.
- Palsson, O. A., Ballou, S., & Gray, S. (2020) *The U.S. national pandemic emotional impact report*. https://www.pandemicimpactreport.com/report/PalssonBallouGray_2020_PandemicImpactReport.pdf.
- Park, C. L., Russell, B. S., Fendrich, M., Finkelstein-Fox, L., Hutchison, M., & Becker, J. (2020). Americans' COVID-19 stress, coping, and adherence to CDC guidelines. *Journal of General Internal Medicine : JGIM*, 35(8), 2296–2303. <https://doi.org/10.1007/s11606-020-05898-9>
- Potter, C. C., Leake, R., Longworth-Reed, L., Altschul, I., & Rienks, S. (2016). Measuring organizational health in child welfare agencies. *Children and Youth Services Review*, 61, 31–39. <https://doi.org/10.1016/j.childyouth.2015.11.002>
- Renkiewicz, G. K., & Hubble, M. W. (2022). Secondary traumatic stress in emergency services systems project: Quantifying the effect of personal trauma profiles on lifetime prevalence of suicidality in emergency medical services personnel. *Air Medical Journal*, 41(5), 463–472. <https://doi.org/10.1016/j.amj.2022.04.002>
- Rienks, S. L. (2020). An exploration of child welfare caseworkers' experience of secondary trauma and strategies for coping. *Child Abuse & Neglect*, 110(3), 104355–104355. <https://doi.org/10.1016/j.chiabu.2020.104355>
- Rienks, S. L. & Leake R. (2020). *Overview of the Comprehensive Organizational Health Assessment (COHA)*. National Child Welfare Workforce Institute. https://ncwwi.org/files/Org_Environment/Comprehensive_Organizational_Health_Assessment_COHA.pdf
- Rosenthal, J. A., & Waters, E. (2006). Predictors of child welfare worker retention and performance: Focus on Title IV-E-funded social work education. *Journal of Social Service Research*, 32(3), 67–85. https://doi.org/10.1300/J079v32n03_04
- Russell, B. S., Tomkunas, A. J., Hutchison, M., Tambling, R. R., & Horton, A. L. (2021). The protective role of parent resilience on mental health and the parent-child relationship during COVID-19. *Child Psychiatry & Human Development*, doi: <https://doi.org/10.1007/s10578-021-01243-1>
- Ryan, J. P., Garnier, P., Zyphur, M., & Zhai, F. (2006). Investigating the effects of caseworker characteristics in child welfare. *Children and Youth Services Review*, 28(9), 993–1006. <https://doi.org/10.1016/j.childyouth.2005.10.013>

- Shell, E. M., Teodorescu, D., & Williams, L. D. (2021). Investigating race-related stress, burnout, and secondary traumatic stress for black mental health therapists. *Journal of Black Psychology*, 47(8), 669–694. <https://doi.org/10.1177/00957984211033963>
- Sedivy, J. A., Rienks, S., Leake, R., & He, A. S. (2020). Expanding our understanding of the role of peer support in child welfare workforce retention. *Journal of Public Child Welfare*, 14(1), 80–100. <https://doi.org/10.1080/15548732.2019.1658020>
- Social Worker Policy Institute. (2010). *High caseloads: How do they impact delivery of health and human services?* National Association of Social Workers Foundation. <http://www.socialworkpolicy.org/wp-content/uploads/2010/02/r2p-cw-caseload-wpi-1-10.pdf>
- Tambling, R. R., Russell, B. S., Park, C. L., Fendrich, M., Hutchinson, M., Horton, A. L., & Tomkunas, A. J. (2021). Measuring cumulative stressfulness: Psychometric properties of the COVID-19 Stressors Scale. *Health Education & Behavior*, 48(1), 20–28. <https://doi.org/10.1177/1090198120979912>
- Tullberg, E., & Boothe, G. (2019). Taking an organizational approach to addressing secondary trauma in child welfare settings. *Journal of Public Child Welfare*, 13(3), 345–367. <https://doi.org/10.1080/15548732.2019.1612498>
- Zhong, B., Huang, Y., & Liu, Q. (2021). Mental health toll from the coronavirus: Social media usage reveals Wuhan residents' depression and secondary trauma in the COVID-19 outbreak. *Computers in Human Behavior*, 114, 106524–106524. <https://doi.org/10.1016/j.chb.2020.106524>

Table 1

Demographic Information of Participants

Variables	Agency A		Agency B		Agency C		Agency D		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender										
Female	8	72.7	4	80	3	100	8	100	23	85.2
Male	3	27.3	1	20	0	0	0	0	4	14.8
Age										
20-29	1	9.1	0	0	0	0	1	12.5	2	7.4
30-39	6	54.5	2	40	1	33.3	5	62.5	14	51.9
40-49	3	27.3	2	40	2	66.7	2	12.5	9	33.3
50-59	0	0	1	20	0	0	0	0	1	3.7
60+	1	9.1	0	0	0	0	0	0	1	3.7
Race										
Black	0	0	0	0	0	0	1	12.5	1	3.7
White	9	81.8	1	20	2	66.7	5	62.5	17	63
Hispanic	1	9.1	2	40	0	0	1	12.5	4	14.8
Hmong	0	0	1	20	0	0	0	0	1	3.7
Multiracial	1	9.1	1	20	1	33.3	1	12.5	4	14.8
BIPOC										
No	10	90.9	3	60	2	66.7	7	87.5	22	81.5
Yes	1	9.1	1	20	0	0	1	12.5	3	11.1
Unsure	0	0	1	20	0	0	0	0	1	3.7
Prefer Not to Say	0	0	0	0	1	33.3	0	0	1	3.7
Education Level										
High School	0	0	0	0	0	0	1	12.5	1	3.7
Associate's	0	0	0	0	0	0	1	12.5	1	3.7
Bachelor's	8	72.7	2	40	1	33.3	3	37.5	14	51.9
Master's	3	27.3	3	60	2	66.7	2	25	10	37
Other	0	0	0	0	0	0	1	12.5	1	3.7
Social Work Degree										
No	7	63.6	2	40	1	33.3	6	75	16	59.3
BSW	1	9.1	1	20	0	0	0	0	2	7.4
MSW	2	18.2	2	40	0	0	2	25	6	22.2
BSW & MSW	1	9.1	0	0	2	66.7	0	0	3	11.1
Job Function										
Investigations	3	27.3	2	40	2	66.7	3	37.5	10	37
Family Support	1	9.1	0	0	0	0	1	12.5	2	7.4
Family Preservation	1	9.1	3	60	0	0	1	12.5	5	18.5
Adoptions	1	9.1	0	0	1	33.3	1	12.5	3	11.1

This is a paper written by a Master of Public Administration student. Their faculty mentor was Professor Lori Weber. Though formatted slightly differently for this journal, the style guide used for this paper was Turabian's Manual for Writers of Term Papers, Theses, and Dissertations, which is typical for papers in this discipline and used in-text citations.

THE IMPACT OF COVID-19 ON UNEMPLOYMENT IN THE FIFTY US STATES

Russell McGregor

Introduction

In December 2019, health officials in Wuhan, China, noticed that individuals were experiencing pneumonia-like symptoms, yet traditional treatments did not work very well on patients (Katella, 2021). This would eventually become known as COVID-19 to the world. By January 31, the World Health Organization declared a global health emergency due to the virus's transmissibility and being a novel virus with limited treatment (Katella, 2021). Without any treatments for the virus, the world's initial reaction in many places, including America, was to contain the spread of the virus so hospitals did not become overwhelmed with patients (Katella, 2021). This led to President Trump issuing a National Emergency on March 13, 2020, which soon led to California issuing the first stay-at-home order in the United States on March 19, 2020 (Aran-go & Cowan, 2020). Soon many other states started issuing policies and recommendations regarding containing the spread of COVID-19.

States within the United States started issuing lockdown orders which led to an increase in unemployment which peaked at its highest in April 2020. Unemployment continued to be much higher throughout the year than the previous year. This research study sought to understand if COVID-19 policies, COVID-19 cases, or economic factors in all fifty US states significantly impact unemployment. Could it be that lockdown orders have the strongest effect on unemployment, or could it be more factors such as COVID-19 case rate, states with a high-

er percentage of hospitality sectors, or even if the state Governor's political part was Republican or Democrat? These indicators help explain the high unemployment states endured during the first year of the 2020 COVID-19 pandemic.

Literature Review

Unemployment in the U.S.

One of the main contributors to the dramatic rise of unemployment across the country was lockdown orders implemented by many states (Bayly, 2020). According to the U.S. Bureau of Labor and Statistics (2023), the unemployment rate rose from 4.4% in March 2020, with 7 million people unemployed, to 14.7% in April 2020 at 23 million. This spike in unemployment was the highest unemployment rate since the great depression peaked unemployment of 24.9% (Bayly, 2020). Unemployment stayed high throughout the year 2020, with December 2020 having an unemployment rate of 6.7% (U.S. Bureau of Labor and Statistics, 2023).

Unemployment is not just an economic indicator of the country's health and economy but also an actual lived experience for individual persons within a country. Unemployment could cause an array of issues for individuals beyond the loss of income. Unemployment could cause scarring, which is a prolonged negative experience on future employment, and lead to more incidents of future unemployment (Egdell & Beck, 2020).

Unemployment scarring could occur in two ways. The first is a poor entrance into the labor market (Egdell & Beck, 2020). These indi-

viduals may be graduating from high school or college and entering a labor market in an economic downturn, such as a recession (Wachter, 2020). These individuals typically are younger, between 18-24 years old, and when entering a tough labor market can experience career displacement, setting their career prospects back or on hold for many years, which can lead to loss of substantial future earnings (Wachter, 2020).

A second way in which unemployment scarring occurs is job losers, which are individuals who were in the labor market working and lost their employment involuntarily (Wachter, 2020). While evidence has shown that unemployment scarring could happen due to any duration of involuntary unemployment, the longer the period of unemployment, the higher the possibility of more substantial, longer, lasting effects of scarring can occur (Egdell & Beck, 2020). Unemployment, either due to poor labor market entrance or job loss, can negatively affect the individual's mental health, leading to anxiety, depression, and low self-esteem (Autin et al., 2020). Additionally, there can be years of lost earnings. Wachter (2020) found that during the 2007-2009 Great Recession, job losers "lost an average of 2.5 years' worth of average annual earning" (p. 565).

There is also the possibility of physical harm being caused by unemployment. Individuals could possibly see a shortened life expectancy (Egdell & Beck, 2020 and Sullivan & von Wachter, 2009). Sullivan and von Wachter (2009) researched death records between 1980-2006 and correlation to job displacement and found that if the hazards of job displacement continued indefinitely, it could lead to an individual losing around 1-1.5 years of their life expectancy (Sullivan & von Wachter, 2009). This means that job displacement can affect all aspects of an individual's life, including physiological, economic, and physical.

Unemployment encompasses not only those who are not working, there are various types

of unemployment and ways the U.S. government counts them. Three types of unemployment can occur within an economy: frictional, structural, and cyclical (Rissman, 1997).

Frictional unemployment can be thought of as the natural time individual skills match the employer's needs for that skill (Hayes, 2022). Factors that cause unemployment during this time are workers searching for a job that matches their abilities, employers putting in the time to recruit qualified individuals, and workers selecting a suitable geographical location to work and moving there (Hayes, 2022 Rissman, 1997). Individuals may not know where a job that is aligned with their skills is located, and the time it takes to search for the job is the time they are unemployed (Rissman, 1997).

Structural unemployment is the loss of jobs that are no longer needed due to technological advances in society (Hayes, 2022, n.p). The economy is restricting itself to new technology, and workers in those previous occupations will need to find new employment (Rissman, 1997). An example of structural employment is the job of a lamplighter. Before the invention of electric lights, lamplighters would set and extinguish street lights throughout a city. However, the need for lamplighters became obsolete due to electric lights, so those workers had to find a new job.

The final type of unemployment is cyclical unemployment. Cyclical unemployment occurs when labor demand falls across multiple sectors of the economy (Rissman, 1997). This can be seen as a recession as many jobs are lost across a wide breadth of society during a similar time due to labor reduction by employers (Rissman, 1997). This is typically a relatively short loss of labor across industries as industries can reverse job loss due to government intervention and economic expansion (Rissman, 1997). Governments usually want to stop or alleviate cyclical unemployment with policies to stimulate the economy (Hayes, 2022, n.p.)

This type of unemployment is what mainly occurred during the COVID-19 pandemic in 2020.

The U.S. Bureau of Labor and Statistics (2015) counts those as employed as “unemployed if they do not have a job, have actively looked for work in the prior four weeks, and are currently available for work” (n.p). Actively looking for a job could be contacting employers, friends, and family for work options, submitting resumes, working with job recruiters, or answering job advertisements (How the Government Measures Unemployment, n.d.). Those who choose to be unemployed, individuals who are unable to work due to age, retired workers, and individuals who are going to school and are not working are not counted as unemployed by the U.S. Bureau of Labor Statistics (How the Government Measures Unemployment, n.d.).

Non-pharmaceutical Interventions

Some of the strategies to prevent the spread of disease also contributed to changes in the labor market, with non-pharmaceutical interventions implemented in states, California being one of them. Non-pharmaceutical interventions are strategies designed to prevent the spread of transmissible diseases. This is especially important when a disease is new, as it may be the most effective way to prevent illness and death (Ahlers et al., 2022). Because COVID-19 was a novel disease that spread quickly, many states took non-pharmacological interventions to prevent its spread to its citizens (Ahlers et al., 2022). In the United States, no national policy or law required every state to follow the same method. Therefore, every state issued their own policies and guidelines (Avery et al., 2021). One of the most common non-pharmaceutical interventions was the stay-at-home order, which required individuals to stay home and only leave for essential items such as groceries or doctor visits (Avery et al., 2021). Many states also restricted what kind of work could be done in person, and put in place restrictions on non-essential business, restrictions on dining in at restaurants and

bars, and limiting the number of people who could gather inside. Additionally, some states restricted in-person activities including schools requiring moving to remote learning during the pandemic (Avery et al., 2021). All these restrictions were put in place to save people’s lives and to limit the spread of the virus, yet the consequences on unemployment were severe.

States could also institute mandatory personal protective equipment (PPE) practices when around other individuals or inside (Shvetsova, et al., 2022). States could issue recommendations or mandatory guidelines to their citizens on wearing PPE in public such as mask-wearing (Shvetsova, et al., 2022). Mask-wearing was initially a precautionary tool but became an effective tool to stop the spread of air droplets that contain COVID-19 from infective individuals, reducing the spread of the virus (Shvetsova, et al., 2022).

Vulnerable Economies

A state economy may also be at a clear disadvantage to a pandemic due to the sector of its economy. States may be vulnerable to a virus that spreads quickly in groups/crowds, and level of vulnerability may depend on strictness of the COVID-19 preventative measures a state government has put in place (OCED, 2021). Restrictions on travel, such as driving or flying from one place to another, and prohibiting non-essential businesses from operating in public caused a sharp decline in jobs in the hospitality sector of the economy (Gursoy, 2020). Reductions in individual habits such as going to bars, restaurants, and hotels, taking a cruise, or attending sports events caused a decrease or halt in revenue for the leisure and hospitality sector of the economy and state economy (Chen, Garcia-Gomez & Zaremba, 2020). Casino and gambling jobs typically depend on air travel and gathering those indoors, which means the spread of COVID-19 and COVID-19 prevention policies affect those businesses immensely (Chen, Garcia-Gomez & Zaremba, 2020, p. 2). Additionally, International travel in 2020 declined by 58% compared

to 2019, affecting 200 million jobs worldwide (Chen, Garcia-Gomez & Zaremba, 2020).

The COVID-19 pandemic led to an increased change in working habits due to the spread of a novel virus and the stringency of economic policies set forth by states (De Fraja, Mizen, Taneja & Thwaites, 2021). Businesses relying on people being in person, entertaining in person, and being in large crowds found it hard to operate at all during a pandemic or because of the state economic policies to prevent COVID-19. This is in contrast to other sectors of the economy. Essential industries such as medicine, necessary goods (farming and grocery stores), and critical infrastructure (for example, energy production) must continue through national shutdowns due to the massive negative impact if they were not to operate in a country (OCED, 2021). Remote work also allowed certain industries to be more resilient compared to leisure and hospitality (OCED, 2021). Industries like financial activities, IT, public administration, education, telecommunication, and so on were able to move to remote work as compared to other jobs (OCED, 2021), allowing employees to work and continue more normal business compared to an industry that requires in-person work (OCED, 2021).

Methods

There were five sources of data, which were compiled into two datasets used to answer the research questions. The data sources were the Local Area Unemployment Statistics Report, New York Times Coronavirus Tracker, Oxford COVID-19 Government Response Tracker, Quarterly Census of Employment and Wages, and National Governor Associate. These were compiled into the March to December 2020 dataset and the March to June 2020 dataset.

The dependent variable is the unemployment rate. The independent variables are the COVID-19 case rate, Stringency Index, percentage of state economies in the hospitality sector, and whether the state had a Republican

Governor. The March to June 2020 dataset and the March to December 2020 dataset analyses were conducted in Posit Cloud, formerly known as R-Studio, performing multiple regression analysis, correlation matrix, variant inflation factor test, and scatter plot analysis.

The March to June 2020 dataset and the March to December 2020 dataset represent two timeframes within 2020. The March to June 2020 dataset represented when states were near the end of their strictest lockdown orders implemented in 2020. The March to December 2020 dataset represents the timeframe when stringency policies within the U.S. had loosened across various states. Comparing these two timeframes could give insight into what caused unemployment to be continuously high throughout 2020. Could it show that only one variable was causing the unemployment to be high, or could multiple factors have caused unemployment to be high?

Results

Using the U.S. Bureau of Labor Statistics local area unemployment statistics data, this paper first identified the states with the highest unemployment rates. Figure 1 shows the unemployment rate from December 2019 compared to the last four months of 2020. Figure 1 also shows the United States national average unemployment rate, which is shown in the orange line. The reason for showing December 2019 is that this month was before the pandemic response measure that occurred across the country in various ways, such as lockdowns. Late 2020 saw an increase in COVID-19 nationwide, which saw many states implement stricter stringency policies. Figure 2 shows the top five states with the highest unemployment rates for each period. Starting in 2019, the highest unemployment rates were in Mississippi (5.5%), Alaska (5.2%), Louisiana (5.1%), New Mexico (5.1%), and West Virginia (5%). The national unemployment rate at this time was 3.6%, showing these states were around 1.9% to 1.4% higher than the national average. In comparison, the

lowest unemployment rates in December 2019 were Hawaii (2%), North Dakota (2%), Utah (2.5%), Colorado (2.6%), and Iowa (2.6%).

Also shown in Figure 2 is the final quarter of 2020. This data shows that the largest unemployment rates were in September 2020, and all states saw a decrease in unemployment by December 2020. Hawaii, Nevada, California, and New York had the nation's top 4 highest unemployment rates. Hawaii had the highest unemployment rate at 14.2% unemployment rate in September. Massachusetts's unemployment decreased by 7.6% in December 2020, making it 0.2% smaller than New Mexico.

The states that saw the highest impact of the COVID-19 pandemic on unemployment are shown in Figure 3, showing the states that saw the largest increase in unemployment as compared to December 2019. Hawaii, which had the lowest unemployment rate at the end of 2019, saw the highest impact on unemployment rates. During 2020, Hawaii saw a 12.2% jump from 2%-14.2% in September. Nevada also saw a considerable increase as well with a 9.8% increase in unemployment from December 2019 at 3.8% to September 2020 at 13.6%. California saw an increase in unemployment by 6.2% from December 2019 to September 2020.

The lowest unemployment in states with the lowest increase in unemployment in 2020 is shown in Figure 4.

In Figure 4, the unemployment rate is shown starting in 2019 as a baseline and showing the last quarter of the year in 2020. Figure 4 shows that Montana, Utah, Wyoming, and South Dakota had a modest rise in unemployment from December 2019 to December 2020. Figure 4 also shows Nebraska having a lower unemployment rate in December 2020 at 2.8% compared to December 2019 at 3.1 with a difference of 0.3%.

Both Figure 3 and Figure 4 show a decrease in unemployment overall throughout the final quarter of 2020, trending downward from

March through April 2020, which saw the highest increase in unemployment in 2020.

Next, this research used Posit to analyze both the March to June 2020 dataset and the March to December 2020 dataset to perform a more statistical data analysis. Figure 5, drawn from the March to December 2020 dataset, shows the scatterplot of Lockdown orders and Unemployment. On the x-axis is the stringency index, and on the y-axis is the unemployment rate of December 2020 subtracted unemployment of December 2019. Each plot represents a state, colored red if that state voted for Trump and colored blue if they voted for Biden. Figure 4 shows that most states that voted for Trump had lower unemployment and fewer stringency policies. However, this data had a few outliers, such as Arizona voting for Biden but having very low unemployment and stringency policies.

Figure 6 was created to see if changing the data from president to governor would change the outliers on the March to December 2020 dataset. Still, the scatterplot colored the plots red if they had a Republican governor and blue if they had a Democratic governor. This was done because state governors had more authority with stringency policies in their state than the federal government. This change gave a better grouping of states by their governor. Figure 6 shows that most states with Republican governors had overall lower unemployment and lower stringency policies. There were also a few outliers in Figure 6. One example is Nebraska. Nebraska had a democratic governor yet had very low unemployment and one of the weakest stringency policies. One possible explanation is that Nebraska has a unicameral legislative body and had a majority Republican body with 35 Republicans in the body as compared to 15 Democrats (2020 Nebraska Legislative Session, n.d.).

Figure 7 shows a scatterplot using the March to December 2020 dataset, but the x-axis has been changed to the COVID-19 cases rate. The scatterplot is colored red if they voted for Presi-

dent Trump and blue if they voted for President Biden. This plot shows that states with the lowest unemployment had the highest COVID-19 incident rates. Figure 7 shows that states with 2 points or lower on the average unemployment scale were predominately states that voted for Trump, with 7 states under 2 points being blue states while 22 were red states. Additionally, over 600 COVID-19 cases per state population were predominantly red states (22 red states compared to 7 blue states). Additionally, states with less than 600 cases were mostly blue states (18 blue states and 3 red states). Figure 7 scatterplot shows a possible correlation between low unemployment and higher overall COVID-19 cases.

Figure 7 shows draws from the March to June 2020 dataset, which shows the scatterplot of the stringency index and unemployment rate. On the x-axis is the stringency index, and on the y-axis is the unemployment rate of June 2020 subtracted unemployment of December 2019. Each plot represents a state, and they are colored red if the state has a Republican governor and colored blue if the state has a Democratic governor. Figure 7 shows a clear divide between red states and blue states. States with a stringency index of 12 or higher were predominantly blue (24 blue states and 6 red states). Additionally, Figure 7 shows that red states still had the lowest unemployment rates and weakest lockdown orders early on in the pandemic compared to blue states. A scatterplot of COVID cases and unemployment is not shown using the June time frame, as early on in the pandemic, had much lower cases of COVID-19 in nearly all states compared to the end of the year.

The next analysis step was to do a correlation matrix and multiple regression analysis on each dataset. The correlation matrix shows numbers on a scale of -1 to 1. Correlation is the independent variable's effect on the dependent variable (Pollock & Edwards, 2016). A number variable with a positive number is a positive correlation between two variables meaning they move in the same direction (Pollock &

Edwards, 2016). The higher the positive number, the more correlated the variables (Pollock & Edwards, 2016). If the number is 0, there is no correlation between the two variables (Pollock & Edwards, 2016). If the number is negative, a negative correlation means they move in the opposite direction (Pollock & Edwards, 2016). The statistical significance in a correlation is statistically significant at 0.01 and 0.05.

A good use of the correlation matrix is also to see if collinearity exists. Collinearity (also known as multicollinearity) is when multiple independent variables are highly correlated. Predicting if variables are genuinely independent becomes difficult with colinearity, meaning regression results are less trustworthy (Tamura, Takano, Miyashiro, Nakata & Matsui, 2019). Detecting multicollinearity requires more than just a correlation matrix (Tamura, et al, 2019). A variance inflation factor or VIF is necessary. A VIF "estimates how much the variance of a regression coefficient is inflated due to multicollinearity" (Investopedia team, 2023, n.p). A VIF score of 1 means there is no correlation. Between 1-5 is moderately correlated and above 5 is highly correlated (Investopedia team, 2023). VIF scores of 5 or more indicate multicollinearity and independent variables must be removed or changed to reduce multicollinearity. This research uses the VIF function on both time frame datasets.

First, I tested Hypothesis 1, that COVID cases will affect unemployment in this longer time period in addition to the share of the state's economic sector which is vulnerable, by conducting a correlation and multiple regression analysis.

The correlation result (Table 1) shows that the unemployment rate positively correlated to stringency and was statistically significant ($r=0.42$, $p = 0.003$). The unemployment rate and COVID-19 case rate showed a weak negative correlation between COVID-19 and unemployment ($r = -0.31$, $p = .027$). This negative correlation is similar to Figure 7, which shows that states with high COVID-19 cases were low-

er in unemployment. This, however, does not show if COVID-19 affected lockdown orders. Republican Governors and the unemployment rate were negatively correlated and statically significant ($r = -0.38$, $p = .007$). The percentage of state economies in the hospitality sector had a weak positive correlation to unemployment but was not statistically significant compared to the other variables ($r = 0.19$, $p = .181$).

The next step was to run a multiple regression on the dependent and independent variables in the March to December 2020 dataset. Multiple regression analysis could show if there is a statistically significant relationship between the multiple independent variables. A multiple regression analysis goes deeper than a correlation as it can show if the independent variable affects the dependent variable (Pollock & Edwards, 2016). A multiple regression analysis will produce a p-value that represents whether the null hypothesis of the regression was rejected or not (Pollock & Edwards, 2018). A p-value of .05 or lower means you can reject the null hypothesis and show there is a relationship between the dependent and independent variables (Pollock & Edwards, 2018). The smaller the p-value, the stronger the evidence that the independent variable affects the dependent variable. The estimated coefficient in the regression results will provide the way in which the independent variable influences the dependent variable, such as if it has a negative or positive slope (Pollock & Edwards, 2018).

Multiple regression analysis is required to see if any of the independent variables grow weaker or stronger and affect the dependent variable when running through the same model. By looking at just bivariate regression or bi-variate correlation of all the independent variables, it shows some significant relationship between each independent variable. However, unemployment numbers could be affected by multiple independent variables at once.

Table 2 shows a multiple regression analysis with unemployment as the dependent variable and stringency index, percentage of states economies in the hospitality sector, COVID-19 case rate, and Republican Governor variables as the independent variables. The regression results indicated the model was significant ($F = 4.691$, $p = 0.003$). The regression only showed that the percentage of state economies in the hospitality sector had contributed significantly to the model ($B = 0.30$, $p = 0.02$). However, the stringency index ($B = 0.19$, $p = 0.30$), COVID-19 case rate ($B = -0.18$, $p = 0.24$), and Republican Governor ($B = -0.26$, $p = 0.11$) did not contribute significantly to the model. The final predictive model was: $\text{unemployment case rate} = -0.68 + (0.19 \text{ stringency index}) + (0.30 \% \text{ of states economies in the hospitality sector}) + (-0.18 \text{ COVID-19 case rate}) + (-0.261 \text{ Republican Governor})$.

Table 2 showed that during the March to December 2020 dataset, states with a higher percentage of economies in the hospitality sector had an increase of 0.19 points of unemployment when controlling for Republican Governors, Stringency Index, and COVID-19 cases rate. Regression showed that Hypothesis 1 was partially correct as the share of the state's economic sector which is vulnerable affected unemployment, but it did not show any other variables, such as the COVID-19 case rate having an impact.

Table 3 shows the VIF on the multiple regression to check multicollinearity for the independent variables. The VIF report did not show any multicollinearity between the independent variables, as all results came well below 5.

This paper now tests Hypothesis 2, that the largest factors affecting unemployment are the stringency of COVID-19 policies and the state's economic sector. I tested this by conducting a correlation and multiple regression analysis. The correlation result (Table 4) shows that the unemployment rate was also positively correlated with stringency and was statistically significant ($r = 0.27$, $p = 0.05$). Un-

ployment and COVID-19 case rates were positively correlated and statically significant ($r = 0.30$, $p = 0.04$). Additionally, republican governor and unemployment were negatively correlated and significant ($r = -0.39$, $p = .01$). Percentage of states economies in the hospitality sector and the unemployment rate were also shown, like Table 1, positively correlated but not statically significant ($r = 0.16$, $p = 0.27$).

Table 5 shows the multiple regression results of the March to June 2020 Dataset. The regression results indicated the model was significant ($F = 4.761$, $p = .003$). The regression showed that the percentage of state economies in the hospitality sector ($B = 0.36$, $p = .01$) and the COVID-19 case rate ($B = 0.32$, $p = 0.03$) contributed to the model. However, similar to Table 1, the stringency index ($B = 0.16$, $p = 0.3$) and Republican Governor ($B = -0.26$, $p = .10$) did not contribute significantly to the model. The final predictive model was: $\text{unemployment case rate} = -3.16 + (0.16 \text{ stringency index}) + (0.35 \% \text{ of states economies in the hospitality sector}) + (0.32 \text{ COVID-19 case rate}) + (-0.26 \text{ Republican Governor})$.

Table 5 showed that during the March to June 2020 Dataset, states with a higher percentage of economies in the hospitality sector had an increase of 0.36 points of unemployment when controlling for Republican Governors, Stringency Index, and COVID-19 cases rate. This was more than double the effect of unemployment as compared to the March to December 2020 dataset. Additionally, an increase in the COVID-19 case rate also led to an increase of 0.32 points of unemployment when controlling for Republican Governors, the Stringency Index, and the percentage of state economies in the hospitality sector. Table 5 showed that hypothesis 2 was partially correct, with the percentage of state economies in the hospitality sector having an effect on unemployment. However, it was also wrong as the stringency index during the March to June dataset did not impact unemployment but, rather, showed that the COVID-19 case rate affected unemploy-

ment. Both multiple regressions in Tables 2 and 5 did not show Republican Governors having a statistically significant effect on unemployment.

Table 6 measures VIF to see if the March to June 2020 dataset was experiencing multicollinearity. As shown in Table 3, the results did not show any multicollinearity between the independent variables, as all results came well below 5.

Discussion

The data of this research first showed that there was a commonality between states with the highest unemployment in the final quarter of 2020: Hawaii, Nevada, California, New York, and Massachusetts. In December, New Mexico had the 5th highest unemployment rate, beating Massachusetts by 0.2%. These top 5 states also saw the highest impact of unemployment as compared to December 2019. The initial data seemed to suggest there was something similar between the five states that caused them all to have continued highest unemployment. This paper also showed the states with the lowest impact of COVID-19. These five lowest-impact states had relatively low unemployment in both datasets.

This paper then used two data sets, March to December 2020 and March to June 2020, to see if COVID-19 policies, COVID-19 cases, or state economic factors have a larger impact on unemployment. Each dataset is representative of a different time during the pandemic in 2020. The March to December 2020 timeframe represents the end of 2020, while the March to June 2020 timeframe represents the end of the strictest stringency policies in the United States. As represented by the March to June 2020 dataset, the first part of the pandemic shows that the COVID-19 case rate affected unemployment. However, the March to December 2020 dataset, encompassing the end of the year 2020 did not show COVID-19 having a continued effect. The data showed the COVID-19 case rate initially affected the unemployment rate, but that effect did not continue in the December timeframe.

Additionally, neither dataset showed a statistical significance of stringency policies on unemployment. This could be due to the strongest stringency policies at the initial start of the pandemic and loosening as the pandemic continued.

Additionally, this paper did show a clear relationship in both datasets: states with a large percentage hospitality sector experienced more unemployment. This result makes sense as this sector was more vulnerable to community spread (such as indoor concerts or casinos). These sectors also experience more restrictions, making working from home, as other economic sectors could, difficult. This paper named unemployment as the dependent variable. Additional research could use the hospitality sector as the dependent variable, seeing what independent variable most affects its unemployment numbers.

This research shows that governments during a pandemic must be aware of the multifaceted effects on their economy, especially unemployment. It also shows that there are factors in addition to government stringency policies affecting unemployment during COVID-19 and highlights the effect of the specific sector of the economy. More research into unemployment and pandemics could give future administrations tools for effectively dealing with a pandemic early on to try to minimize the suffering people endure during high unemployment.

Future Research

Future research could look at more variables to determine if there is a relationship between unemployment and factors such as the state GDP, how educated the state's population is, and the state's poverty percentage. Additionally, future research could explore 2021 and 2022 to see if any variables related to COVID-19 early on were having a lingering effect on unemployment. Since unemployment continued to drop rapidly in 2021 and 2022, it would be interesting to see the full picture of unemployment during the COVID-19 pandemic. Addi-

tionally, this study only covered the two periods of 2020, the end of many lockdown orders and right after they ended. Additional research could focus early on, such as a dataset covering just March 2020 to April 2020, or focus on where the highest unemployment percentages were all around the country. That dataset may be able to show the effect of stringency orders as compared to the two datasets within this paper. Lastly, future research could compare other countries along with U.S. states in 2020 to see if there were similar trends between the independent variables considered in this paper.

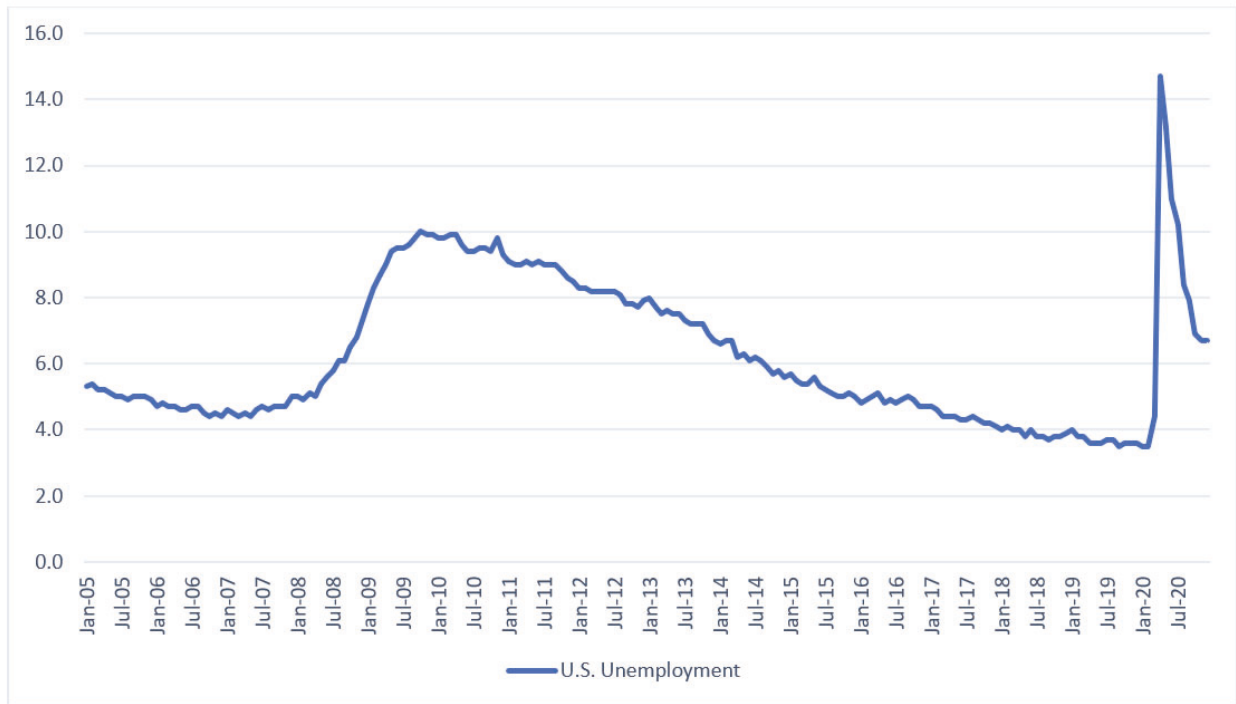
References

- 2020 Nebraska legislative session. (n.d.). Ballotpedia. Retrieved April 9, 2023, from https://ballotpedia.org/2020_Nebraska_legislative_session
- Ahlers, M. M., Aralis, H. H., Tang, W. W., Sussman, J. B. J. B., Fonarow, G. C., & Ziaecian, B. B. (2022). Non-pharmaceutical interventions and covid-19 burden in the United States: Retrospective, observational cohort study. *BMJ Medicine*, 1(1). <https://doi.org/10.1136/bmjmed-2021-000030>
- Arango, T., & Cowan, J. (2020, March 20). Gov. Gavin Newsom of California Orders Californians to Stay at Home. *The New York Times*. <https://www.nytimes.com/2020/03/19/us/California-stay-at-home-order-virus.html>
- Autin, K. L., Blustein, D. L., Ali, S. R., & Garriott, P. O. (2020). Career Development Impacts of COVID-19: Practice and Policy Recommendations. *Journal of Career Development*, 47(5), 487–494. <https://doi.org/10.1177/0894845320944486>
- Avery, A. J., Wang, J., Ma, X., Pan, Q., McGrady, E. E., Yuan, Z., Liang, Y., Nugent, R., & Lakdawala, S. S. (2021). Variations in Non-Pharmaceutical Interventions by State Correlate with COVID-19 Disease Outcomes (p. 2021.07.28.21261286). *medRxiv*. <https://doi.org/10.1101/2021.07.28.21261286>

- Bayly, L. (2020, May 8). Unemployment rate soars to 14.7 percent, highest level since the Great Depression. NBC News. <https://www.nbcnews.com/business/economy/u-s-economy-shed-record-20-5-million-jobs-last-n1202696>
- Chen, M.-H., Demir, E., García-Gómez, C. D., & Zaremba, A. (2020). The impact of policy responses to COVID-19 on U.S. travel and leisure companies. *Annals of Tourism Research Empirical Insights*, 1(1), 100003–100003. <https://doi.org/10.1016/j.annale.2020.100003>
- De Fraja, G., Matheson, J., Mizen, P., Rockey, J., Taneja, S., & Thwaites, G. (2021). Covid reallocation of spending : the effect of remote working on the retail and hospitality sector. School of Health and Related Research, University of Sheffield.
- Egdell, V., & Beck, V. (2020). A Capability Approach to Understand the Scarring Effects of Unemployment and Job Insecurity: Developing the Research Agenda. *Work, Employment and Society*, 34(5), 937–948. <https://doi.org/10.1177/0950017020909042>
- Governors. (2023). National Governor Association. Retrieved March, 2023 from <https://www.nga.org/governors/>
- Gursoy, D. (2022). Effects of COVID-19 pandemic on hospitality industry: Review of the current situations and a research agenda. *Journal of Hospitality Marketing & Management*. 29(5), 527-529. <https://doi.org/10.1080/19368623.2020.1788231>
- Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S., & Tatlow, H. (2021). “A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker).” *Nature Human Behaviour*. <https://doi.org/10.1038/s41562-021-01079-8>
- Hayes, A. (2022, December 8). What Is Unemployment? Understanding Causes, Types, Measurement. Investopedia. <https://www.investopedia.com/terms/u/unemployment.asp>
- How the Government Measures Unemployment: U.S. Bureau of Labor Statistics. (n.d.). U.S. Bureau of Labor Statistics. Retrieved February 28, 2023, from https://www.bls.gov/cps/cps_htgm.htm#unemployed
- Investopedia Team. (2023, February 12). Variance Inflation Factor (VIF). Investopedia. [https://www.investopedia.com/terms/v/variance-inflation-factor.asp#:~:text=A%20variance%20inflation%20factor%20\(VIF\)%20is%20a%20measure%20of%20the,adversely%20affect%20the%20regression%20results.](https://www.investopedia.com/terms/v/variance-inflation-factor.asp#:~:text=A%20variance%20inflation%20factor%20(VIF)%20is%20a%20measure%20of%20the,adversely%20affect%20the%20regression%20results.)
- Katella, K. (2021, March 9). Our Pandemic Year—A COVID-19 Timeline. Yale Medicine. <https://www.yalemedicine.org/news/covid-timeline>
- OECD (2021), Strengthening Economic Resilience Following the COVID-19 Crisis: A Firm and Industry Perspective, OECD Publishing, Paris, <https://doi.org/10.1787/2a7081d8-en>.
- Pollock, P. & Edwards, B. (2016). The Essentials of political analysis. SAGE Publishing.
- Pollock, P. & Edwards, B. (2018). An R companion to political analysis. SAGE Publishing.
- Rissman, E. R. (1997). Measuring labor market turbulence. *Economic Perspectives* (1977), 21(3), 1–17.
- Shvetsova, O., Zhirnov, A., Adeel, A. B., Bayar, M. C., Bayrali, O. G., Catalano, M., Catalano, O., Chu, H., Giannelli, F., Muftuoglu, E., Rosenberg, D., Seyis, D., Skopyk, B., VanDusky-Allen, J., & Zhao, T. (2022). Protective Policy Index (PPI) global dataset of origins and stringency of COVID 19 mitigation policies. *Scientific Data*, 9(1), 319–319. <https://doi.org/10.1038/s41597-022-01437-9>
- Sullivan, D., & von Wachter, T. (2009). Job Displacement and Mortality: An Analysis Using Administrative Data. *The Quarterly Journal of Economics*, 124(3), 1265–1306. <https://doi.org/10.1162/qjec.2009.124.3.1265>

- Tamura, R., Kobayashi, K., Takano, Y., Miyashiro, R., Nakata, K., & Matsui, T. (2019). Mixed integer quadratic optimization formulations for eliminating multicollinearity based on variance inflation factor. *Journal of Global Optimization*, 73(2), 431–446. <https://doi.org/10.1007/s10898-018-0713-3>
- The New York Times. (2021). Coronavirus (Covid-19) Data in the United States. Retrieved 11-14-2022, from <https://github.com/nytimes/covid-19-data>.
- U.S. Bureau of Labor Statistics. (2023). Local Area Unemployment Statistics. [Data set]. <https://www.bls.gov/lau/home.htm>
- U.S. Bureau of Labor Statistics. (2023). Quarterly Census of Employment and Wages. [Data set]. <https://www.bls.gov/cew/>
- Wachter, T. (2020). Lost Generations: Long-Term Effects of the COVID-19 Crisis on Job Losers and Labour Market Entrants, and Options for Policy. *Fiscal Studies*, 41(3), 549–590. <https://doi.org/10.1111/1475-5890.12247>

Figure 1: United States unemployment rates, January 2005 - December 2020



Local area unemployment statistics (<https://www.bls.gov/lau/>, 2023)

Figure 2: States with the highest unemployment rates

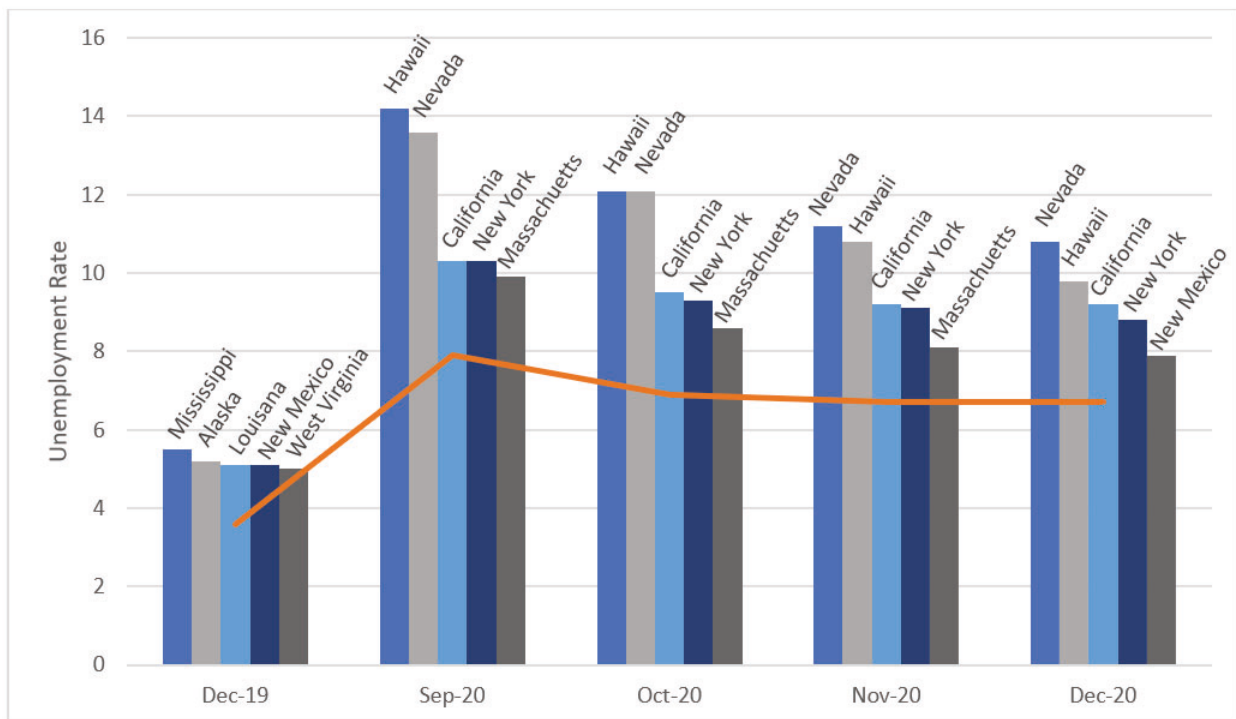


Figure 3: States with the highest impact of COVID-19 on unemployment rates

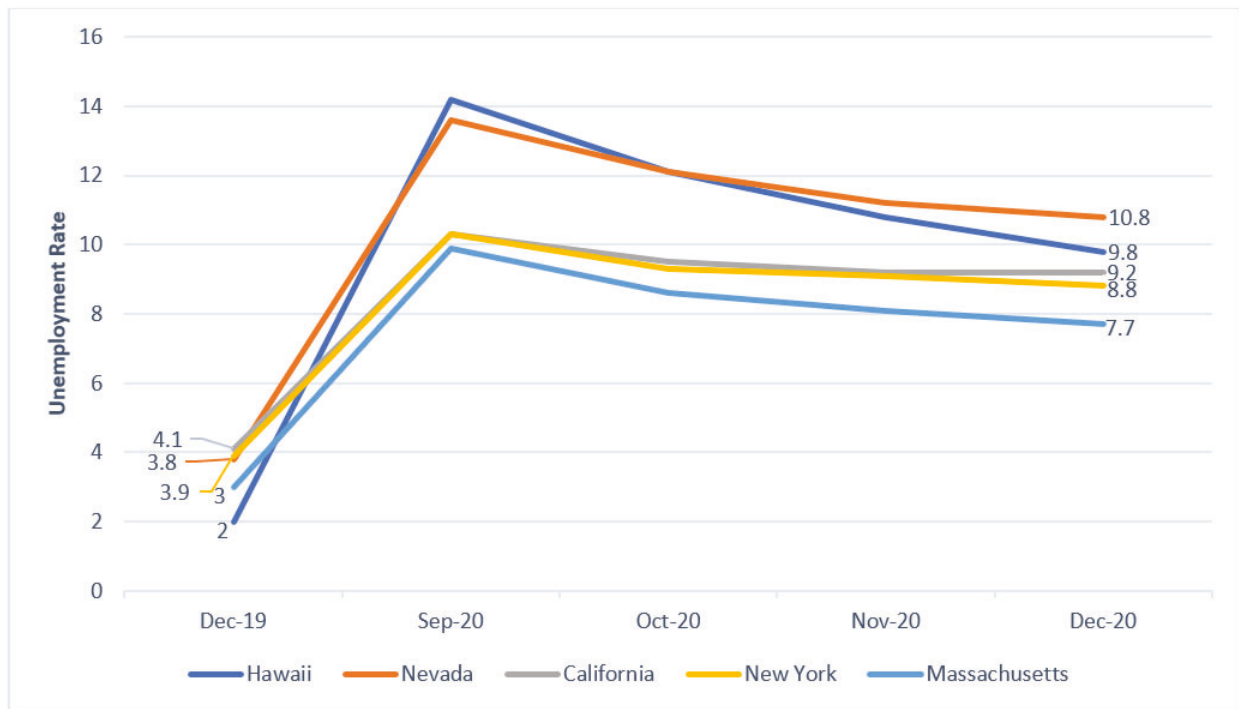


Figure 4: States with the lowest impact of COVID-19 on unemployment rates

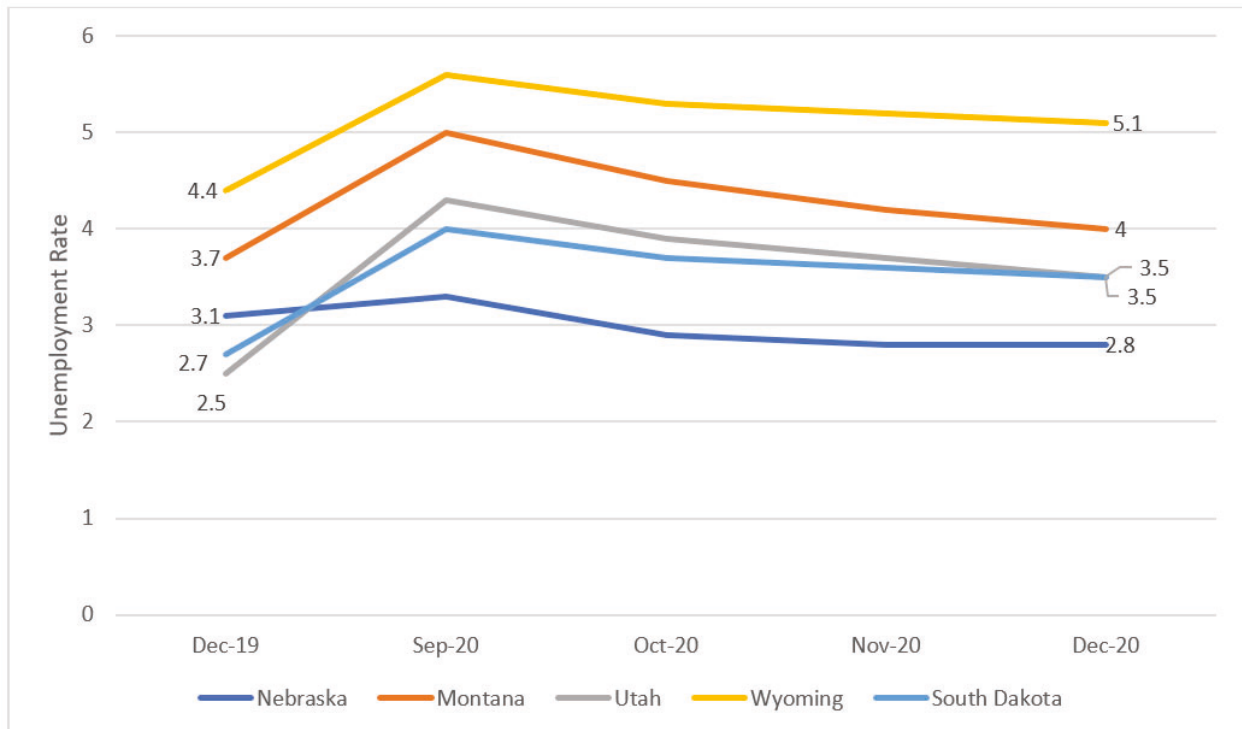


Figure 5: Stringency Index and Unemployment by State and how they voted in the 2020 Presidential election. March to December 2020 Dataset

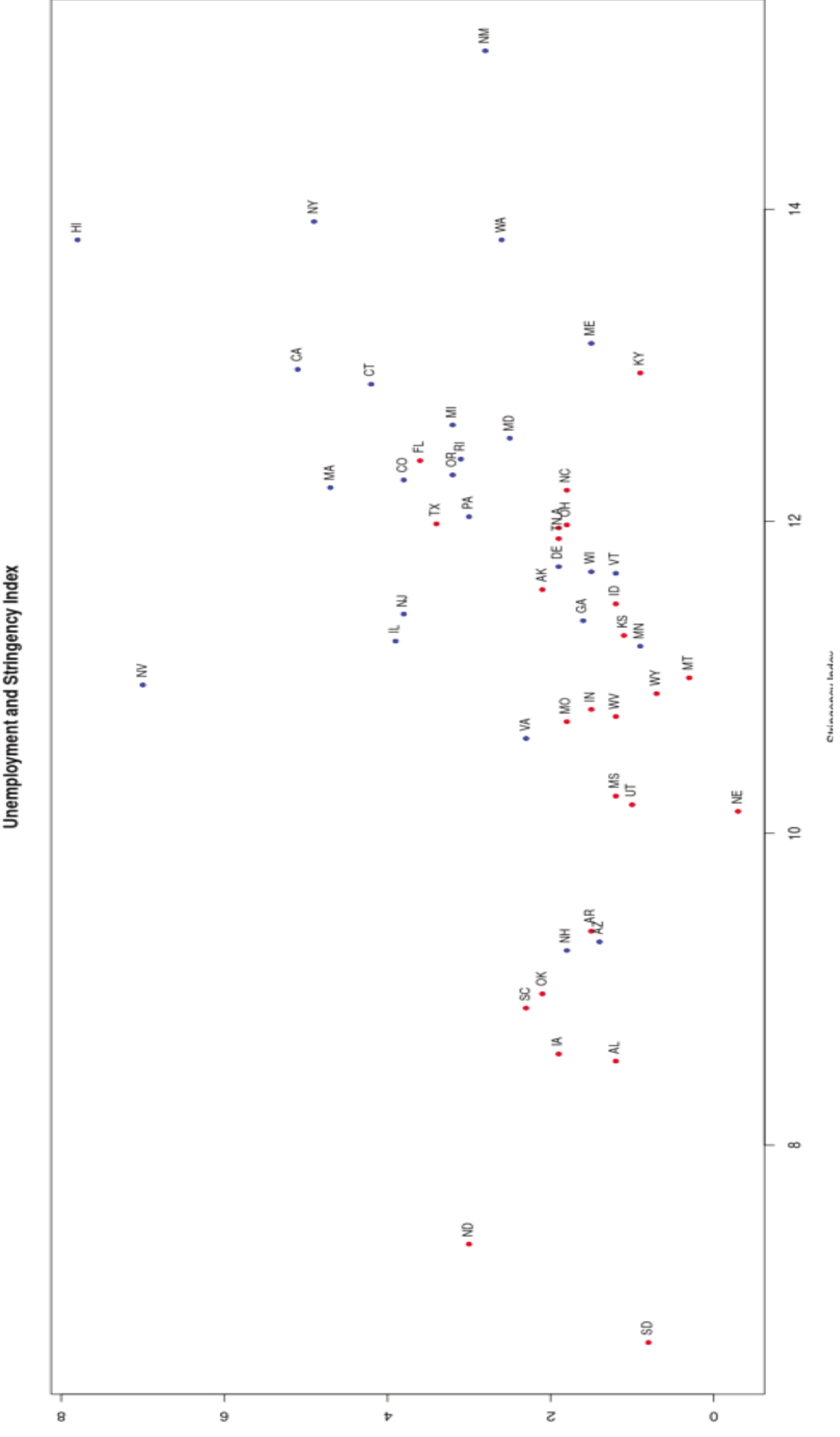


Figure 6: Stringency Index and Unemployment by State and Governor Political Party: March to December 2020 Dataset

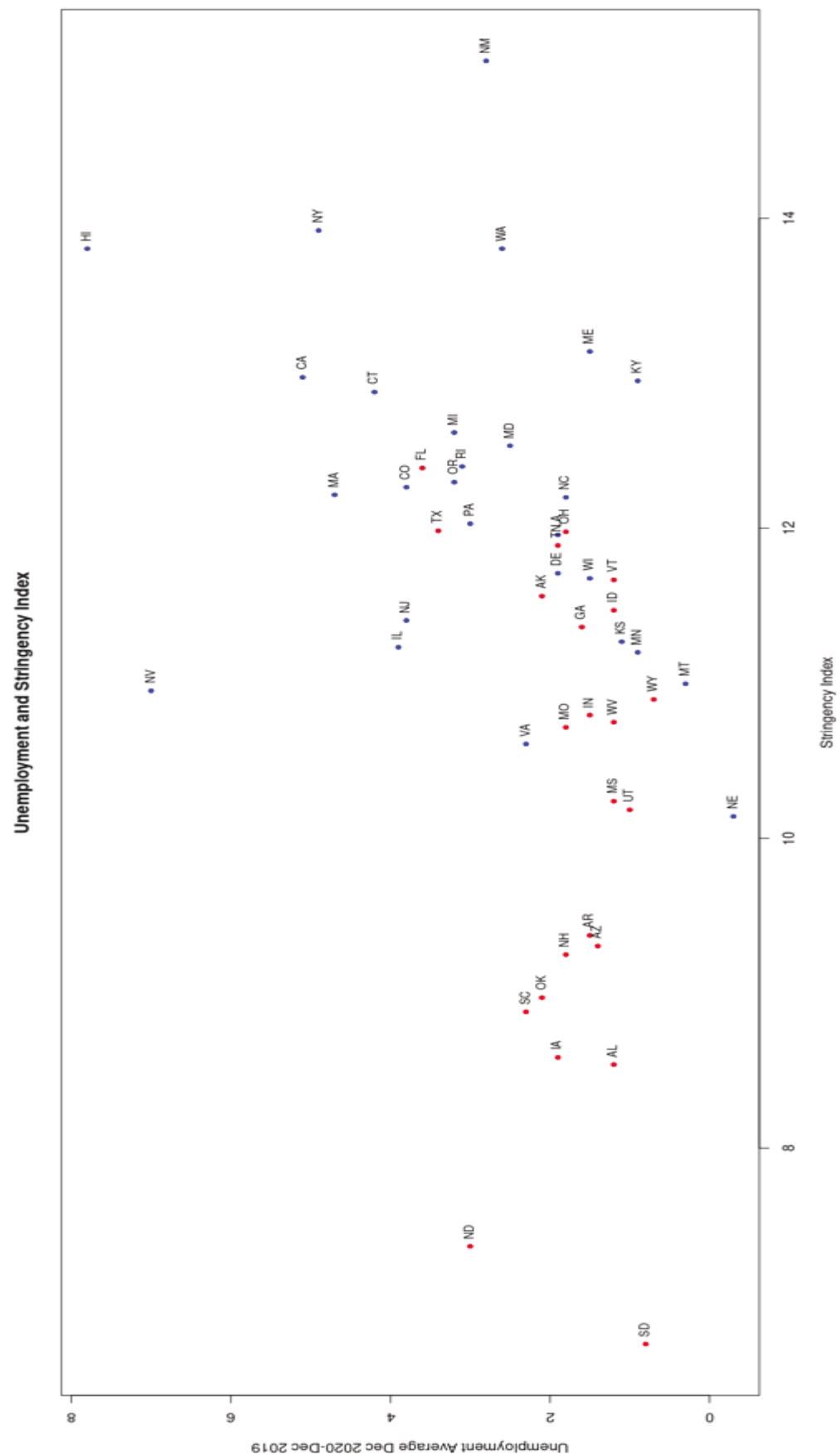


Figure 7: COVID-19 Average cases and Unemployment by State and Governor Political Party. March to December 2020 Dataset

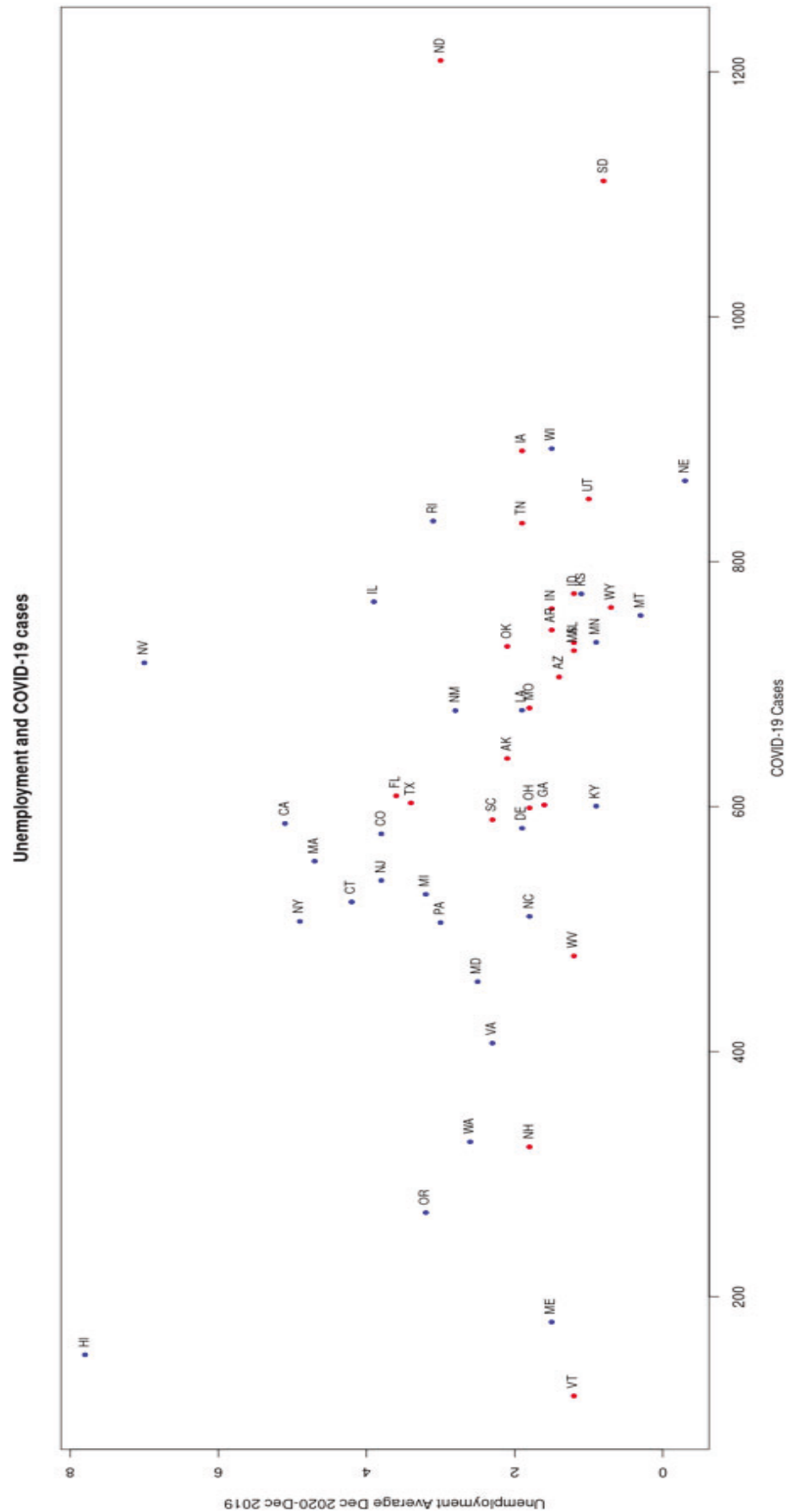


Figure 8: Stringency Index and Unemployment by State and Governor Political Party: March to June 2020 Dataset

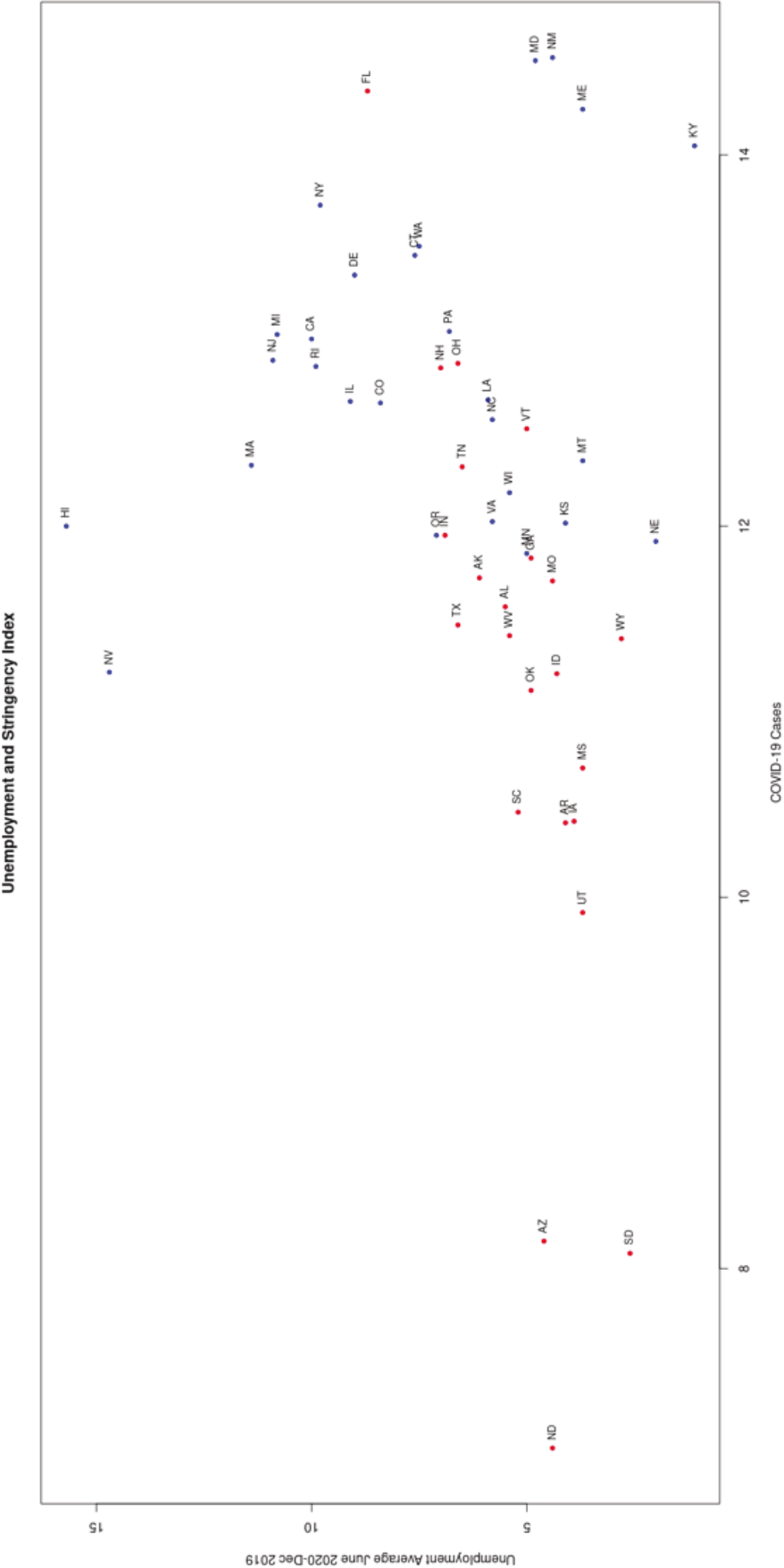


Table 1: March to December 2020 Dataset Correlation for all Variables

		Unemployment	Stringency Index	% of states economies in the hospitality sector	Covid-19 case rate	Republican Governor
		(1)	(2)	(3)	(4)	(5)
(1)Unemployment rate	Correlation Coefficient	1.00	.042**	0.19	-0.31*	-0.38**
	p-value		0.0027	0.1806	0.0271	0.0068
(2) Stringency Index	Correlation Coefficient		1.00	-0.14	-0.57**	-0.61**
	p-value			0.3456	0.0000	0.0000
(3) % of states economies in the hospitality sector	Correlation Coefficient			1.00	0.19	0.18
	p-value				0.1873	0.2125
(4) Covid-19 case rate	Correlation Coefficient				1.00	0.29
	p-value					0.0404*
(5) Republican Governor	Correlation Coefficient					1.00
	p-value					
(n=50)						
**Correlation is significant at the 0.01 level (2-tailed)						
*Correlation is significant at the 0.05 level (2-tailed)						

Table 2: Multiple Regression Analyses I to examine March to December 2020 dataset with unemployment as DV

	b	B	p
Variables			
Stringency Index	0.184	0.194	0.298
% of states economies in the hospitality sector	0.284	0.300	0.024*
Covid-19 case rate	- 0.001	-0.184	0.239
Republican Governor	-0.822	-0.261	0.11
Intercept	-0.682		0.798
<i>Adjusted R square</i>	0.232		

Ordinary Least Squares regression analysis was used. All significant tails are two-tailed

Table 3: VIF (December): Results

Stringency	COVID-19	Republican Governor	Hospitality
2.158080	1.516098	1.627737	1.058126

Table 4: March to June 2020 Dataset Correlation for all Variables

		Unemployment	Stringency Index	% of states economies in the hospitality sector	Covid-19 case rate	Republican Governor
		(1)	(2)	(3)	(4)	(5)
(1) <u>Unemployment</u>	Correlation Coefficient	1.00	0.27*	0.16	0.30*	-0.39**
	p-value		0.0543	0.2671	0.0364	0.0056
(2) Stringency Index	Correlation Coefficient		1.00	-0.23	0.14	-0.56**
	p-value			0.1161	0.3450	0.0000
(3) % of states economies in the hospitality sector	Correlation Coefficient			1.00	-	0.18
	p-value				0.35**	0.2125
(4) Covid-19 case rate	Correlation Coefficient				1.00	-0.30*
	p-value					0.0354
(5) Republican Governor	Correlation Coefficient					1.00
	p-value					
(n=50)						
**Correlation is significant at the 0.01 level (2-tailed)						
*Correlation is significant at the 0.05 level (2-tailed)						

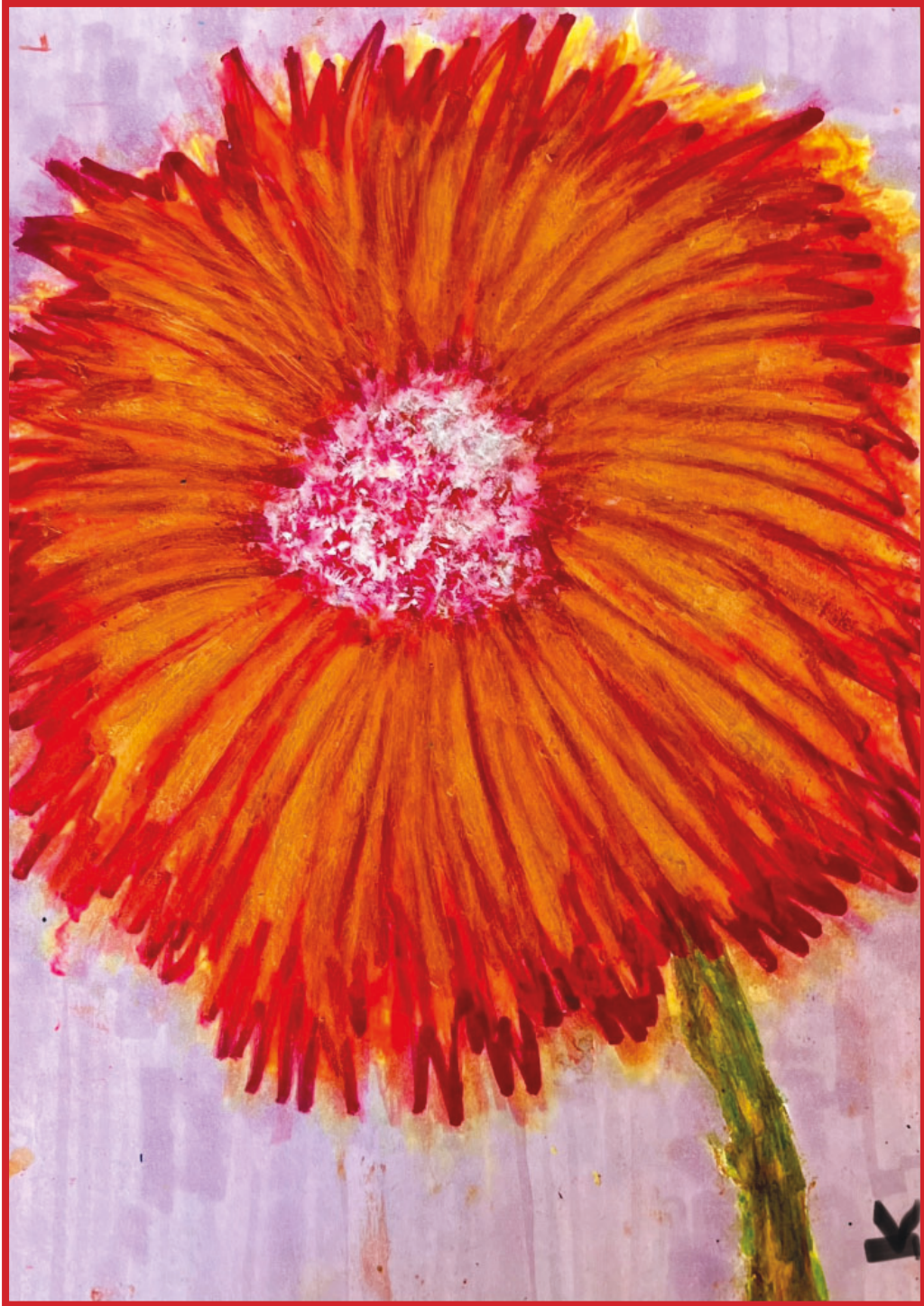
Table 5: Multiple Regression Analyses 2 March to June 2020 Dataset with unemployment as DV

	b	B	p
Variables			
Stringency Index	0.313	0.161	0.300
% of states economies in the hospitality sector	0.632	0.355	0.012*
Covid-19 case rate	2.146	0.319	0.026*
Republican Governor	-1.569	-0.263	0.101
Intercept	-3.1558		0.5124
<i>Adjusted R square</i>	0.235		

Ordinary Least Squares regression analysis was used. All significant tails are two-tailed

Table 6: VIF(June): Results

Stringency	COVID-19	Republican Governor	Hospitality
1.517283	1.227709	1.586040	1.181206



STUDENT ABSTRACTS

UNDERGRADUATE STUDENT ABSTRACTS

Butte County Hmong Youth Wellbeing Mixed Methods Study

Celia Alejandre

Faculty Mentor: Shelley Hart

Recently, there has been an alarming rise in youth suicide¹. For example, for U.S. youth aged 15 to 19, after a period of stability from 2001 to 2009, rates increased 57% from 2009 through 2017. Additionally, key indicators of suicide have increased, with almost 1 in 4 reporting seriously considering suicide, almost 1 in 5 reporting a plan, and almost 1 in 10 reporting an attempt². This mixed methods study examines suicidal thoughts and behaviors in Hmong youth. We will explore well-being experiences at school, connection with friends and family, engagement in physical activity, exposure to drugs and alcohol, attitudes about mental health, help-seeking behaviors, ethnic identity, and suicidal thoughts and actions. The study has three objectives: a) to explore suicidal thoughts and behaviors for youth who have versus who have not reported a suicidal plan in the last twelve months; b) to explore various psychological, social, and academic factors for those who have versus who have not reported a suicidal plan in the last 12 months; and c) to inform school-based prevention efforts in our community. A convenience sample of twenty-four Hmong youth were recruited through researcher connections with community-based organizations (mean age = 15.83; 50% female). All participants attended an after-school youth group and the community leader inquired about participation. Interested youth were provided the survey link to complete online during group time. Participants were offered a \$5 Dutch Bros gift card. Those who expressed interest will engage in an interview in fall of 2023. Thematic analysis will be used to examine patterns of meaning within the qualitative data. Quantitative analyses will be primarily descriptive; however, relationships

between variables will be examined for youth who reported a suicide plan in the last 12 months compared to those who did not. Unfortunately, 50% (n=8) of our participants reported having made a suicide plan throughout the last twelve months (missing data for 8 participants). We anticipate there will be noticeable differences between those who have and who have not reported a suicide plan in terms of psychological (e.g., identity), social (e.g., sense of belonging), and academic (e.g., academic stress) characteristics.

1. Curtin S. C., Garnett M.F. (2023). Suicide and homicide death rates among youth and young adults aged 10–24: United States, 2001–2021. *NCHS Data Brief*, no 471. Hyattsville, MD: National Center for Health Statistics. <https://dx.doi.org/10.15620/cdc:12842>
2. Centers for Disease Control and Prevention (2023). Youth risk behavior survey: Data summary & trends report. https://www.cdc.gov/healthyyouth/data/yrbs/pdf/yrbs_data-summary-trends_report2023_508.pdf

Contemporary migration of the Americas: A Viewpoint from Tijuana, Mexico

Brian Iran Cervantes Arellano

Faculty Mentor: Stephen Lewis

Contemporary migration in the Americas has predominately been perceived as emigrants marching towards the US and Canada. However, relatively little is known as to what migration looks like in transit countries or in the modified migrant destination - the country in which migrants are starting to settle and considering staying in. Mexico, traditionally understood as an emigrant country, is a country full of internal migration, international immigration, and transit. Based on field and bibliographical research in Tijuana, Baja California, -one of the more important cities in international migration- we sought to develop a qualitative study on the aspirations, backgrounds, and conditions of international migrants currently in Tijuana. In essence, a survey was developed, yet unable to be employed due to institutional barriers, oversaturation, and overall difficulties in reaching

the migrant population. However, various revelations arose. Migrants in Mexico are coming in unseen numbers, with a much wider range in nationalities than ever before; now, not just central Americans are transiting (towards the US) and seeking to stay in Mexico. Venezuelans, Cubans, Haitians, Ecuadorians, Colombians, Nicaraguans, and even Angolans and other African nations have migratory presence in Mexico (although in relatively fewer numbers than Latin American countries). Mexico, in short, has transformed from an expelling country towards a country of destination, asylum, and huge transit.

Our research focus has shifted towards internal migration - a migration even more invisible and unaccounted for than international migration: that of Mexicans moving within national territory. Reasons for this shift include limitations in applying traditional methodology to international migrants, many of which are in refugee centers and non-governmental camps. But the predominant reason, is the revelation that this sector (Mexicans migrating to different parts of the country) has been much more prevalent, and is an uncontrolled phenomenon, which implies a political, economic, social and cultural toll on such a diverse country. In an era with growing violence, climate issues, high rates of urbanization, yet seemingly prosperous economic development with a generation of higher educational achievement, we see Mexicans as an extremely mobile population. Perhaps understanding the movements occurring within the country can even tell us much as to how institutions and society, are to react to international migration arriving in the country.

Using Internet of Things Design Project to Inspire Entrepreneur Mindset in Underrepresented Minorities in Engineering Programs

Ulisses Cervantes

Faculty Mentor: Hadil Mustafa

Recent studies indicate that a significant portion of industry executives, approximately 51%, lack critical soft skills, such as problem-solving, critical thinking, communication, innovation, and creativity. Traditionally, many engineering programs often limit students' exposure to real-world problem-solving and experiential learning to Capstone courses, leading to a lack of well-rounded skills among recent graduates. Despite incorporating various methods to improve these skills, engineering programs may still fall short of allowing students to participate in genuine, open-ended inquiry activities that promote creativity and problem-solving [1].

To tackle this prevailing issue of soft skill deficit among recent engineering graduates, participants undertook an Internet of Things (IoT) project design approach to cultivate an entrepreneur mindset (EM) and promote self-reliance. EM in this work was defined as "The inclination to discover, evaluate, and exploit opportunities." The Internet of Things is a term used to describe a paradigm of systems consisting of devices, sensors, and processing units that connect and work together to communicate data over the Internet. Participants were required to propose, plan, design, and implement solutions to real-world challenges using an IoT-based design. To evaluate the outcome of this study, participants responded to metacognitive reflection prompts using Photovoice. Photovoice is a qualitative learning assessment tool used to collect and analyze data using a combination of photos with captions and reflections.

The proposed project in this study aimed to create a cost-effective security system tailored to college students, engaging an entrepreneurial and engineering perspective while collab-

orating closely with a professional. Through ideation, refinement, and creation, participants gained valuable insights into product development and the proactive approach required to bring ideas to life. This journey proved challenging yet exhilarating, culminating in the transformation of concepts into tangible realities. Besides fostering the development of new technical skills, the project also facilitated the growth of professional competencies. The study highlights the significance of cultivating an EM to equip engineering graduates for a dynamic and competitive professional landscape. The findings emphasize the importance of hands-on, open-ended inquiry activities in developing research skills and improving self-reliance among engineering graduates to enhance their overall preparedness for the workforce.

[1] Hadil Mustafa, "Promoting Entrepreneurial Mindset in Engineering Students Using IoT-Focused Project-Based Learning, ASEE 2023, Baltimore, MD

The Safety Coffin - Life Preserver or Capitalizing on Phobia in the 19th Century

Starlene Diaz

Faculty Mentor: Alisa Wade

In 1868, inventor Franz Vesper organized an exhibition in Newark, New Jersey, to showcase his new invention: the Vesper Burial Case. 600 attendees paid fifty cents each to see the design, which featured a rope attached to a bell for the victim to ring for help if they were buried alive. Vesper's invention capitalized on the paranoia of possible victims being buried alive. Stories of wills written with directives to cut off limbs to confirm death and reprints of ads of victims being buried alive caused terror throughout the nineteenth century. This research project reveals that significant changes in industrialization, a lack of medical knowledge, and the growing commodification of the death industry explain this focus on fear. The project explores the relationship between designs like Vesper's Burial Case in advertising and taphophobia, the fear of being buried alive. It analyzes if the

phobia was exploited for profit or designed to meet genuine needs. For its methodology, an array of primary source materials are consulted, including newspaper clippings from the mid-19th century, including various prints of media, from patent designs to one text titled *Premature Burial and How It May Be Prevented* in 1905 and multiple accounts of unfortunate victims being buried alive. The evidence drawn from advertising and exhibits suggests that taphophobia was exploited. Vesper charged 50 cents: nineteen dollars in current funds, an immense amount at the time. The average person could not afford to view such luxury, suggesting the decision by Vesper and others to target wealthy patrons alone. A contradiction at the core of this phenomenon — that the general public believed in the necessity of safety coffins yet was not considered the target audience to purchase them — is compounded by the fact that there is no clear evidence of a safety coffin saving a single life. This is not an outdated fear; the legacy of this fear continues into the present, as safety coffins are commissioned currently, as evidenced by a 2014 patent. Further research is recommended to examine the safety coffin through the lens of ad campaigns for exploitation.

Activism and Spray Paint: Environmental Graffiti in Bogotá Colombia

Alondra Juaregui and Kate Minderhoud

Faculty Mentor: Brian Brazeal

This article is a case study of ethnographic analysis on the interconnection between public art in the public urban spaces of Bogotá, Colombia, and its effect on legislation. This is an exploration study on how mural painting can impact public perception, specifically on the topic of environmental activism and the social commentary it produces in its wake. Mural painting and graffiti have long been used to disseminate messages to the viewing audience in pictorial images. Within the past decade, there has been an exponential increase in graffiti and mural painting in Bogotá centered on making

socio-political statements aimed to increase public awareness. This is due to the decriminalization of graffiti across Colombia, resulting in a hub of both local and foreign artists. Additionally, the utilization of graffiti within the context of environmental activism has been bolstered by the newly elected, more environmentally friendly focused president and vice president. After delving into the historical background and significance of environmental public art, the specific aspect that requires more research is the difference between mural artists and taggers. Both types of artists play an important role in disseminating environmental messages. However, they use very different methods, with varying levels of legality. Throughout our preliminary research, it is clear that these groups of artists are somewhat divided. An additional goal of this case study is now to discover, through further in-person ethnographic research, if this differentiation impacts the effectiveness of public art as a means of environmental activism. This will be determined by conducting in person interviews with both the general public, and the artists themselves. We hope that this study will provide a foundation for understanding how art changes public perception, and seek to determine what the long term implications of public art based education can have on resolving community stumbling blocks. This study is still in progress, and further research is required. Both in person fieldwork and additional literature studies will occur throughout the next six months. This study will ultimately result in a short documentary, produced with the assistance and technology of the Advanced Laboratory for Visual Anthropology at Chico State.

Qualitative Evaluation of a Food Product Analysis Project Among College Students in the United States and Ecuador

Sally Mead

Faculty Mentor: Keiko Goto

Collaborative Online International Learning (COIL) aims to foster cross-cultural student

competence through the development of multi-cultural learning environments that bring professors and students together from two countries. This study examined the impact of a food product examination project through COIL on global and inter-cultural communication and collaboration skills among students who are enrolled in food and nutrition courses in the United States and Ecuador. Students taking a semester-long nutrition course at a university in California and students in a culinary art course in Ecuador worked in groups to complete a food product examination project. The project focused on examining five Ecuadorian food products (hominy, potato, quinoa, plantain, and cassava). Students collectively developed “global” dishes utilizing these Ecuadorian products as part of a nutrition education initiative that helps target a specific population in Ecuador. Eleven qualitative in-depth interviews were conducted with both US and Ecuadorian students who participated in the project. The transcribed data were coded using thematic analysis. The themes that emerged from the analysis were examined, compared, and synthesized across the interviews. A qualitative evaluation and the authors’ experience revealed that food played an important role in enhancing inter-cultural communication and collaboration in three main ways. First, it was found that food was an effective icebreaker and a tool for team building exercises or activities. Second, food also played a role in learning about the culture and identifying the similarities between the two cultures in a unique way. Finally, experiential learning through food, such as cooking and tasting food, appeared to help students stay motivated about the project and make the group project more enjoyable. Our findings suggest that food may be used as a tool for cross-cultural communication and collaborative learning in higher education. Further research is needed to effectively evaluate learning outcomes of food-related COIL projects.

The Crucial Connection: Exploring the Impact of University Housing on Student Success and Retention

Nathend Olivares Velazquez
Faculty Mentor: Kim Jaxon

University housing plays a critical role in shaping students' college experiences, particularly for first-time freshmen transitioning away from home. While recent research has focused on aspects related to student success and the first-year experience, there has been minimal exploration of the influence and impact of housing. University housing's role in contributing to student success has often been overlooked or downplayed, with its potentially significant impact on students often underestimated. This research explores the impact of university housing on student success and retention, emphasizing its interconnected nature with various aspects of students' lives. This research does not oppose or contradict most of the current studies on student success; instead, it serves to address a literature gap, specifically focusing on the significant influence of university housing. The study employs a qualitative research approach, using one-on-one interviews with former residents to gain insights into their experiences. The sample size for the interviews was limited, comprising only 12 former residents. Despite the small sample size, it encompassed individuals from various academic years, current residents, as well as those who had served as resident advisors and desk attendants. Two case studies were selected for a more comprehensive and in-depth analysis with the aim of gaining a broader perspective. These two interviews revealed themes related to positive and negative peer influence, the significance of housing location, and the role of Resident Advisors (RAs). These themes are supported by existing literature, highlighting the importance of university housing in fostering a supportive campus environment and promoting student retention. The paper concludes with suggestions for enhancing university housing: 1) creating inclusive communities, 2)

implementing Living-Learning Communities, 3) improving RA training, and 4) promoting healthy behaviors. By recognizing the pivotal role of university housing, institutions can enhance students' overall college experiences and support their academic and personal growth.

The Social Pressure First-Generation Students Have with Families to Not Fail

Angelica Santibanez
Faculty Mentor: Eileen Morris

This study focuses on the social pressure experienced by first-generation students within their families when it comes to pursuing higher education. The research aims to gain a deeper understanding of their perspectives, motivations, struggles, and challenges in order to enhance support from educational institutions. The unique aspect of this study lies in its focus on how family dynamics and social factors in California State Universities influence the academic progress of first-generation students. To gather firsthand insights, qualitative methods such as surveys and questionnaires will be conducted. The primary objective is to identify recurring themes and patterns in the daily pressures faced by students, enabling the provision of appropriate services and information for their success. Anticipated outcomes include shedding light on significant issues and devising quick solutions to prevent future disturbances. The study also underscores the aspirations of first-generation families who view education as a pathway to a better life. Moreover, the financial burdens and personal sacrifices made by family members further compound the pressure on students to advance academically. Parental involvement is also recognized as a crucial factor contributing to positive student achievement. Existing research supports the notion that social pressure not only impacts the mental health of first-generation students but also their academic performance. These students often navigate a difficult environment, feeling inadequate, lacking support systems, and fearing disappointment. They

also struggle with the fear of being perceived as inadequate. Recognizing and addressing this pressure is essential to facilitate academic success and promote the overall mental well-being of first-generation students, enabling them to reach their full potential. To address the implications of this study, specific strategies in various categories must be offered to provide academic and psychological assistance. The involvement and support of those around these students can foster a sense of belonging, strengthen them, and help them excel academically. Creating a supportive atmosphere that acknowledges their unique challenges can make a significant difference. Ultimately, this research was motivated by personal experience and is driven by the desire to create and promote diversity in higher education and to equip first-generation students with the necessary tools to combat societal pressures and overcome the world.

GRADUATE STUDENT ABSTRACTS

Making Stewardship First: Community Collaboration in Collections Management Policy

Isabel Araujo

Faculty Mentor: April Kamp-Whittaker

Since the 1970's, collaborative efforts within the museum and source communities have increased. Following the 1990 passage of the Native American Graves and Repatriation Act (NAGPRA) and the subsequent passage of CalNAGPRA in 2001 in California, collaboration became increasingly necessary and significant. These laws mandated that Native American Tribes be consulted to repatriate ancestral remains and cultural belongings held in museum collections. A literature review of collaborative efforts within the museum community revealed a pervasive gap that exists in practice. Collaboration exists in some form through NAGPRA and CalNAGPRA and partnerships in museum exhibits, but hardly reaches the care and management of museum collections. This may be due to the implicit fact that collections are viewed as property, which makes collection management fundamentally about ownership. Collaboration in the collection thus means that there is an understood relinquishment of ownership. In 2023, the Office of Tribal Relations (OTR) was gifted an extensive collection of contemporary Native American and indigenous art representing artists across the Americas. OTR wants to provide access to Native Americans and educators so that they may interact with and learn from the collection. The Museum of Anthropology (MOA) and OTR are collaborating to support these goals as we are already invested in education and outreach, as well as a museum studies program. However, there is no existing policy to describe and facilitate this type of collaborative endeavor between OTR and the MOA or the care and stewardship of this community-focused collection. A re-

view and analysis of existing policy and literature will guide our research and methods. In helping to build a collaborative collections policy that brings in both the MOA and OTR, we are able to develop language that will facilitate partnership. We anticipate a Collection Policy for OTR be completed by Spring 2024. Having a written policy will help future researchers and collections managers in the CSU system have language and policies they can draw from as they look to build collaboration into collections. The policy will also help to provide insight into California Native American history and the importance of policies to be in place.

Pilot Study: Time and Temperature to Eliminate Foliar Fungal Endophytes

Tawny Bolinas

Faculty Mentor: Gerald Cobián

Foliar fungal endophytes (FFE) are fungi that reside within the leaves of plants without causing any visible symptoms or signs of disease. These foliar communities exhibit remarkable diversity, with potentially hundreds of different fungal species coexisting within a single host. While some of these fungi have been shown to play crucial roles in plant defense mechanisms and adaptation to stressful environments, the functions of many others remain unclear. It is assumed that some fungi are involved in the decomposition of leaf litter once leaves have abscised. Understanding community assembly processes associated with the colonization of leaves after abscission and the influence of FFE on the colonization of decay fungi is critical for a greater understanding of carbon cycling. The community composition of ecological communities is influenced by stochastic and deterministic community assembly processes (e.g., priority effects). Focusing on fungal communities from green leaves through the decomposition process by investigating their roles

in leaf litter decomposition and effects on the carbon cycle at Big Chico Creek Ecological Reserve (BCCER), this study contributes to a deeper understanding of ecosystem dynamics. The findings can illuminate how FFE shape leaf litter communities, impact nutrient cycling, and influence carbon sequestration. By tracking the temporal changes in fungal communities, it offers insights into ecological succession and adaptation within ecosystems, enhancing our broader knowledge of microbial ecology and ecosystem function. The pilot project determines the optimal combination of temperature and duration required to sterilize *Quercus lobata* leaves obtained from BCCER. While various methods, such as gamma radiation and X-ray, have been used to remove microbes from internal tissues, there were no facilities nearby Chico to employ these methods. Therefore, we utilized autoclave heat and pressure, being aware that high heat could potentially negatively impact leaf biochemistry. We successfully identified the lowest temperature of 75°C and a time of 15 minutes as the combination necessary to completely eliminate FFE. The findings from this project will provide valuable insights for the methodology of a subsequent field experiment designed to investigate the roles of FFE in the decomposition of leaf litter and ultimately their influence on the carbon cycle.

Toward a Characterization of the Metric Dimension of Barabasi-Albert Random Graphs

Pablo Curiel

Faculty Mentor: Carter Tillquist

A graph consists of a set of nodes V and a set of edges E connecting nodes in V . Given a graph $G=(V, E)$, a subset of nodes $R \subseteq V$ is called resolving if all nodes in the graph can be uniquely identified based on their distances to the nodes in R . The metric dimension of a graph is the minimum number of nodes required to form a resolving set. Intuitively, this

concept is similar to the idea underlying GPS, where distances to three satellites are enough to identify any point on Earth. Metric dimension has several real-world applications, including source localization and providing low-dimensional feature vectors for machine learning.

Barabási-Albert random graphs share many characteristics with real-world networks, including the number of connections between nodes and the number of so-called “hub” nodes. This model’s preferential attachment exemplifies the “rich-get-richer” phenomenon observed in many real-world networks.

The metric dimension of various kinds of random graphs has not been studied thoroughly. This work set out to better understand metric dimension on Barabási-Albert random graphs. This can provide better understanding of real-world applications of metric dimension, such as representing genetic sequence data from DNA for biological research. Computational and experimental methods were used to analyze the size of resolving sets in relation to graph parameters. The Information Content Heuristic approximation algorithm was used to obtain small resolving sets for various graph parameters. This data appeared to show phase transitions in metric dimension as the total number of edges increased. A change-point detection algorithm highlighted the locations of these phase transitions. Various measures of node importance, called centrality measures, were investigated for the elements of resolving sets. As the total number of edges in these graphs increased, the standard deviations of the centrality measures seemed to approach zero. This suggests that nodes in resolving sets are basically the same in terms of centrality when the number of edges passes a certain point.

Future work includes applying more analytical and probabilistic approaches to determine an upper bound for the metric dimension with high probability and identifying the precise locations of relevant phase transitions.

Unveiling Gender Roles and Identity in Chico's Founding: Exposing Women's Leadership in its Prosperity through the Turn of the Twentieth Century

Maggie Farlow

Faculty Mentor: Alisa Wade

History has often been written from the perspective of the dominant or powerful groups, leading to the erasure of the experiences and contributions of marginalized communities. Examining the founding of Chico, California, through the recovered voices of leading women creates a more inclusive and accurate understanding of the past. This project focuses on the lives of these influential women of Chico—Annie Bidwell, Ardenia Boydston Morehead, Emma Wilson, and Ella Gatchell—through its settlement to the turn of the twentieth century, shedding light on their roles, contributions, and the evolving dynamics of gender within the context of a developing frontier community. Through a case study approach, this project followed the lives of these four women by tracing their connections to one another and looking at the primary sources they left behind. This project traces their business, social, and familial networks by examining various newspaper articles, business records, deeds, club rosters, property maps, and other sources. Because Chico primarily attracted settlers with its agricultural potential rather than as a Gold Rush hotspot, it possessed a more balanced gender ratio. That demographic reality, alongside Chico's frontier nature, offered opportunities for women to defy gender expectations and harness their agency. These four women were all similar in that they were white women who held esteemed positions within the community. Still, besides that, they all brought something different to the enrichment of Chico and illuminated trends from the time. All four of them served as community leaders, working as philanthropists, entrepreneurs, educators, and doctors. Their contributions encompassed various aspects of community development, social initiatives, education, and cultural enrichment.

The women from this project, along with other women in Chico's past, played vital roles in shaping the town's character that continues to endure today, whether through brick and mortar, like Hotel Diamond, or through the sense of community at the city's core. This study offers the opportunity for continued research of other minority groups of Chico's past, such as women of color, whose impact and contribution are less known due to the marginalization of their voices.

Public Management and Monitoring Systems for the Integration of Commercial Cannabis Operations in Local Government

Fernando Infante

Faculty Mentor: Sarah Smith

About 56 percent of cities across the state of California have no system of public administration to monitor cannabis operations within their jurisdiction. There are significant efforts by the Department of Cannabis Control through grant funding systems to encourage local governments to develop a legal framework to open permit system that help increase access to legal cannabis operations. The cannabis industry is evolving differently across every city and county in the state. To develop administration systems that are efficient throughout the different regions and adhere to market demands across the state, this paper assesses the obstacles to building a healthy environment for a safe commercial cannabis industry. The main obstacles identified by policy makers and entrepreneurs in the industry demonstrate the challenges to the integration of the industry. The obstacles are the following: (1) multijurisdictional authority; (2) operational market structure; (3) taxation regimes; and (4) black market operators. To develop a monitoring system that efficiently incorporates commercial cannabis onto the local and regional governments, this study incorporates quantitative and qualitative data retrieved from local government officials, and managers in the private industry. Exploring the

data to analyze the obstacles can help identify what components of the industry are important for incorporating into the administration of the permit system. The permit system is the foundational instrument of administration to develop monitoring systems that can more efficiently integrate local and regional operators into the legal market. Implementing systems of operational design found within general system theory, the research seeks to demonstrate that cannabis as a product is transitioned from a product in the black market to state monitoring product. The successful integration of the product is based on the development of permit systems that encourage collaborative practices that include local and regional operators to construct community development practices that will strengthen relationships between regional operators and public administrators.

Determining the Impact of Adolescence Stress on the Oxytocin System

Recamier Juaregui Ocampo
Faculty Mentor: Shawn Bates

Uncovering factors that influence the vulnerability of adolescents to stress is imperative to improving treatment strategies. This is vital since adolescents, particularly those with stress related mental illnesses, are more likely to develop substance use disorders. These disorders are often concomitant with stress-related psychiatric illnesses that disproportionately impact adolescents. Preliminary data (n= 39) has shown an increase in morphine reward in stressed female mice compared to non-stressed mice, with one dose of morphine (20mg/kg). With two exposures to morphine, males (stress and non-stressed) show a significant preference to morphine compared to females. Female mice do not show preference for morphine reward after a second exposure. The present study aims to examine the role of stress experienced in adolescence on opioid reward and dependence and oxytocin activity in adolescent male and

female mice. Utilizing immunohistochemistry, we will examine levels of the neuropeptide oxytocin and the immediate early gene c-Fos, in stressed and non-stressed mice. Stress has been shown to dysregulate oxytocin signaling. In rodents, stress has been shown to increase neuronal activity in the amygdala (AMY), locus coeruleus and prefrontal cortex. Some studies have demonstrated the effectiveness of oxytocin in treating drug response in humans and rodents by lowering craving and cue-response. Particularly, higher levels of oxytocin neuronal activity in the nucleus accumbens (NAcc) are associated with a decrease in drug reward. Furthermore, higher levels of oxytocin in the bed nucleus of the stria terminalis (BNST) have been associated with higher stress levels, particularly in females. C-Fos reactivity is a biomarker used to identify stimuli-induced changes in brain activity. Consequently, c-Fos in stress and reward related regions can illuminate neurobiological changes caused by stress and opioid use in the adolescent brain. We predict that higher activity in the AMY, NAcc, and BNST after stress will be associated with higher drug response. We predict that stress will increase opioid reward and dependence in male but not female mice. The results of this project are of clinical importance because they may inform research and new treatment strategies for adolescent mental illness and substance use.

The Intersection of Culture, Developmental Stages, and Mental Health Among Mexican American Young Adults in Rural and Urban Communities

Ashley Macias
Faculty Mentor: Judy Vang

The children of Mexican immigrants living in the United States, have shown to have a more difficult time developing a sense of cultural identity due to the possible familial pressures of preserving Mexican cultural identity and societal pressures to assimilate into the dominant

cultural identity. This disturbance in identity could lead to individuals developing symptoms of mental health disorders, including borderline personality disorder and maladaptive behaviors (Jørgensen, 2006). Previous literature suggests that adolescents with a weak sense of self had lower reading and spelling levels, as well as lower mathematical abilities (Hay et al., 1998). The purpose of the study is to understand the impact biculturalism has on identity formation throughout adolescent development and, subsequently, its implications on the individual's experience navigating the United States education system, their mental health, and their family dynamic. A cross-sectional, qualitative study will be performed to interview 12 young adults between the ages of 18 and 19 years olds. The interview questions that will be used were created using an interpretive phenomenological analysis. The final results for this research study are pending; however, previous literature suggests the stress from acculturation may negatively impact an immigrant's physiological and mental health (Torres et al., 2012; Cervantes et al., 2019; Finch et al., 2004). Further understanding is needed on the role that cultural identity, or lack thereof, plays on Mexican American adolescents' mental health, education, and family dynamics may help in implementing interventions that foster a stronger self-esteem.

Keywords: cultural loss, identity formation, Latino adolescents

Public Sector Accommodation of Neurodivergence

Sonia Quintero

Faculty Mentor: Charles Turner

This paper identifies and recommends neuro-inclusive accommodation policies. It stems from a study conducted at California State University (CSU), Chico, called "Accommodation of Neurodivergence in Higher Education," which aims to address the significant challenges faced by neurodivergent students, faculty, and staff.

These challenges arise not only from variations in functional abilities and accommodation requirements but also from the stigma and social barriers directed at individuals with neurodivergent conditions (e.g., Autism, ADHD, and Dyslexia). Consequently, neurodivergent individuals often experience lower levels of success in higher education compared to their neurotypical counterparts (Dwyer, et al., 2022). Moreover, this population tends to be underemployed or occupies part-time positions in entry-level jobs, resulting in low income, limited access to health care, and dependence on public welfare (Boeltzig, Timmons, & Butterworth, 2008). These equity gaps are further exacerbated when coupled with intersecting identities, misdiagnosis, and co-occurring disabilities. The existing accommodations for neurodivergence are insufficient. The needs of neurodivergent individuals could be improved by actively learning from those with invisible disabilities. It is known that access to higher education and successfully completing a degree can lead to elevated employment rates, higher salaries, and increased social mobility compared to those without higher education (Migliore et al., 2012). The purpose of this study is to identify and recommend policies that are neuro-inclusive. It is mixed-methods research that includes a review of existing laws, policies, and higher education models related to accommodations for neurodivergent individuals, as well as in-person group interviews, field expert interviews, and open-ended survey questions. The paper argues that fostering faculty understanding, building a supportive campus community, and facilitating networking through existing programs can yield several benefits, including higher recruitment and retention rates among neurodivergent students and employees, a reduction in fail and withdrawal rates, a shorter time to degree completion and increased employment opportunities. This neuro-inclusive model aspires to be broadly applicable to higher education institutions. The implementation of equitable policies will diminish social barriers and stig-

ma while promoting improved equity between neurodivergent and neurotypical populations.

Beliefs about End-of-Life Decisions for Companion Animals

Arely Saldana

Faculty Mentor: Linda Kline

Research on human-animal interactions is ever increasing, yet little is known about the cognitive elements behind the decisions made at the end of a pet's life (e.g., general attitudes towards animals). With medical advances in veterinary practice prolonging the lives of companion animals and the process of euthanasia evolving to include pet owners as decision-makers in this process, it is vital to develop an understanding of the pet owners' attitudes and beliefs that underlie end-of-life decisions. Previous research often focuses on the grief and bereavement of pet owners who lose their companion animals (Planchon et al., 2002) or the veterinarians who euthanize them (Dickinson et al., 2011). The purpose of the present study is to develop a survey instrument for assessing attitudes and beliefs about end-of-life, quality of life, and perceived appropriateness of euthanasia as a means to end the life of companion animals. Participants are being recruited using Amazon Mechanical Turk. A sample size of 300 is expected. Each participant will complete a Qualtrics survey consisting of three different instruments: a survey assessing end-of-life beliefs about companion animals (there are two versions – one regarding dogs and one regarding cats), the Pet Attitude Scale – Modified (Munsell et al., 2004), and the Animal Empathy Scale (Paul, 2000). Data collection is currently underway. Separate principle component analyses will explore the underlying structure of the 49 items of the cat end-of-life survey and the dog end-of-life survey. Once the factors on each scale are established, correlations with these factors, animal empathy, and attitudes towards pets will be conducted. Results will be

compared to previous results from a sample of college students (pilot study) in order to explore differences in factor structure based on age and experience with companion animal care. This study is an essential step in identifying the elements behind pet owners' end-of-life decisions regarding companion animals. Understanding these elements is the first step to providing veterinarians and pet owners with cognitive tools to address difficult end-of-life decisions.

Are Humans Just as Impulsive as Nonhuman Animals? An Attempt to Directly Replicate Jimura et al. (2011)

Arely Saldana

Faculty Mentor: Patrick S. Johnson

Delay discounting describes how the subjective value of an outcome decreases as the delay to its receipt increases (Madden & Johnson, 2010). Compared to humans, who often tolerate reward delays on the order of years, nonhuman animals discount rewards very steeply, with rewards losing half of their value when delayed by seconds. Recently, Paglieri (2013) cautioned against the conclusion that nonhuman animals are more impulsive than humans, suggesting instead that differences in delay discounting may be attributable to differences in the procedures used in human and nonhuman animal studies. Notably, whereas humans typically answer questionnaires featuring hypothetical choices between “smaller-sooner” (SS) and “larger-later” (LL) monetary rewards, nonhuman animals always choose between real SS or LL outcomes (e.g., food) in real time. To examine whether procedural differences could lead to different performances in delay discounting tasks, Jimura et al. (2011) had human participants complete two delay discounting tasks: one involving choices between real SS and LL outcomes (fruit juice) and one involving choices between hypothetical SS and LL outcomes (money). Under these conditions, Jimura et al. observed significantly steeper discounting of

delayed liquid rewards compared to delayed monetary rewards, suggesting that humans discount like nonhuman animals when choices for real rewards are delayed by seconds. Despite the importance of these results in understanding cross-species differences in delay discounting, no attempts have been made (to our knowledge) to replicate the procedures of Jimura et al. (2011). The present study therefore aimed to compare delay discounting of real liquid and hypothetical monetary following the procedures of Jimura et al. (2011). During experimental sessions, participants ($N = 9$) completed a real liquid discounting task (e.g., 8 mL of juice delivered immediately vs. 16 mL of juice available after a delay), a hypothetical monetary reward discounting task, and a memory filler task. We successfully reproduced the within-subjects findings of Jimura et al., suggesting that humans discount just as steeply as nonhuman animals when the reward is experienced. Planned future research will now compare discounting between real and hypothetical rewards of the same commodity to prevent any confounding due to the experience (or absence) of delay.

Home Share Project: Exploring a Unique Affordable Housing Solution

Rosario Zepeda

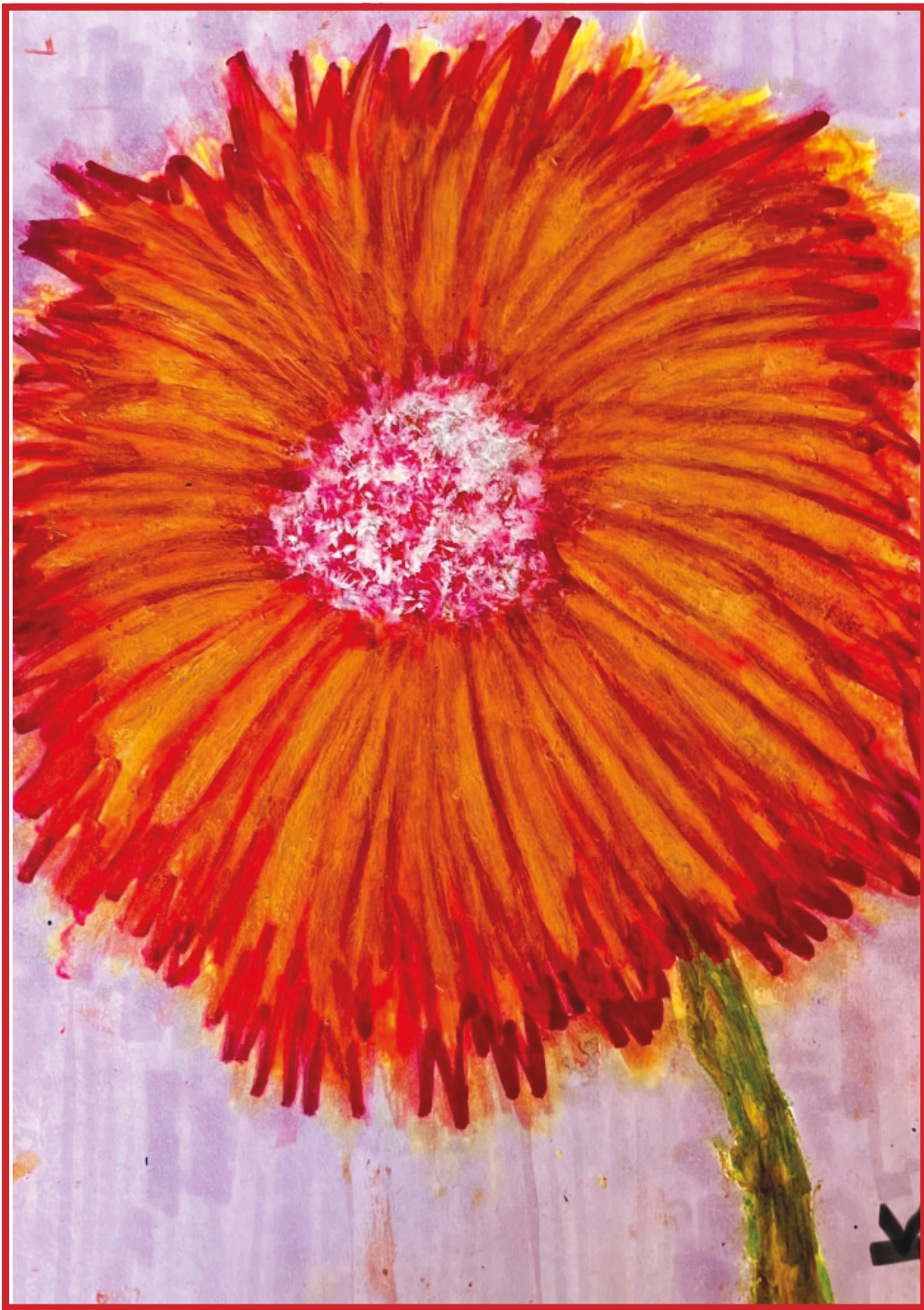
Faculty Mentor: Molly Calhoun

In the state of California, homelessness is perhaps one of the most significant socioeconomic issues. The state has already spent billions of dollars in resources to combat the housing crisis. Although there are many causes of homelessness, the shortage of housing is one of the biggest challenges to reducing it. The fastest-growing demographic in California for those seeking aid for homelessness are those aged 55 and older, yet their susceptibility to housing insecurity is often unnoticed. Homesharing is a concept designed to utilize the current housing stock by matching home providers (people with an extra room) with home seekers (those seeking afford-

able housing). Additionally, many homesharing programs are geared towards intergenerational relationships where older adults can age in place through the support of home seekers.

This study aims to build on current literature to provide insight into the homeshare relationships in regard to motivations, relationship dynamics, caregiving, and the role of the third-party organization. Additionally, this research will illuminate differences based on rural and urban geographies in Northern California. This study is a community-engaged qualitative research project designed collaboratively by a team of individuals from UC Berkeley, Sacramento State, and Chico State. Data will be collected through semi-structured interviews.

Eligible participants in this study include people who are currently or recently (within the past year) involved in the homeshare program as either a “home provider” or “home seeker” for at least three months. The homeshare programs collaborating on this research project are Home & Heart in Chico; Homeshare American River in Sacramento; and Front Porch in the Bay Area. Data will be gathered from 35 to 50 individuals. The final results are pending. This study is imperative for increasing understanding of homesharing programs as a solution to the housing crisis and providing additional care for older persons, a demographic whose needs are often disregarded.



STUDENT AUTHORS

About Our Student Authors

Undergraduate Students



Celia Alejandre is an undergraduate student majoring in Child Development and Latin American Studies, currently conducting research on the well-being of Hmong youth in Butte County. Her project, titled “Butte County Hmong Youth Wellbeing Mixed Methods Study,” explores various aspects of youth well-being, including experiences at school, friendships, engagement in physical activities, exposure to substances, attitudes toward mental health, help-seeking behaviors, ethnic identity, and suicidal thoughts. Through this important work, Alejandre seeks to contribute to the understanding and support of Hmong youth, promoting healthier outcomes and enhanced well-being in their lives.



Brian Iran Cervantes Arellano is an undergraduate with a double major in Social Science (specializing in Sociology and Economics) and Latin American Studies. His research, titled “Contemporary migration of the Americas: A Viewpoint from Tijuana, Mexico,” is focused on bringing to light the experiences of migrants in Mexico, and delved into internal migration within Mexico in order to assess how institutions and society deal with the phenomenon.



Ulisses Cervantes is an undergraduate studying Mechatronic Engineering, dedicated to fostering diversity and innovation in engineering fields. His research project, “Using Internet of Things Design Project to Inspire Entrepreneur Mindset in Underrepresented Minorities in Engineering Programs,” addresses the critical skills gap in engineering graduates. Recognizing that approximately 51% of industry executives lack essential soft skills—such as problem-solving, critical thinking, communication, innovation, and creativity—Cervantes aims to enhance the educational experience for underrepresented minorities in engineering.



Karen Contreras is an undergraduate majoring in Biochemistry and Biology, currently investigating the intriguing role of testosterone in the predisposition to idiopathic scoliosis (IS). This research addresses a critical gap in understanding the gender disparity in IS severity, as women are known to experience more pronounced spinal curvature than men. While estrogen’s effects have been widely studied, the impact of testosterone has remained largely unexplored until now. Through this innovative research, Contreras hopes to shed light on the biological mechanisms behind idiopathic scoliosis and contribute to the broader understanding of spinal health.



Pablo Curiel is an undergraduate majoring in Applied Mathematics, currently engaged in research focused on the metric dimension of Barabasi-Albert random graphs. The concept of metric dimension parallels the functionality of GPS technology, as it represents the minimum number of nodes necessary to uniquely identify all nodes within a graph, akin to the satellites needed to pinpoint a location on Earth. Through this project, Curiel seeks to enhance the mathematical community's knowledge of random graphs and their unique characteristics, laying the groundwork for future research in this area of study.



Starlene Diaz is an undergraduate History major exploring the intriguing phenomenon of the safety coffin and its significance in 19th-century society. This research project investigates the invention of the safety coffin, designed to save lives. By tracing the material culture associated with these inventions, she seeks to understand how such inventions reflect societal attitudes and fears of the era.



Alondra Jauregui is an undergraduate majoring in Anthropology. Her research with fellow undergraduate Kate Minderhoud is titled “Activism and Spray Paint: Environmental Graffiti in Bogotá Colombia” and focuses on the interconnectivity between art, social change, and the community in Colombia. Jauregui’s aim is to exemplify the voices of underrepresented communities.



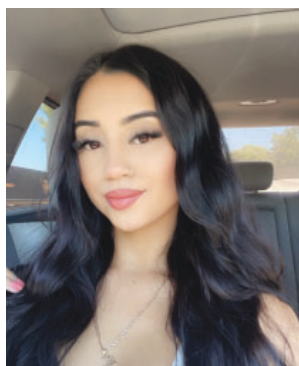
Sally Mead is a Nutrition and Food Sciences major who wanted to gain experience in research and work with professor Keiko Goto who helped her see that everyone has to start somewhere - telling Sally, ‘if you apply yourself, anything is possible.’ As a low-income student supporting herself through college, this program offered a funded research opportunity and a challenge. Sally was able to overcome the imposter syndrome and learned collect and code data, schedule her work at her own pace, manage her time, and be flexible and accommodating. She also learned how to interpret results professionally and was able to ask a research question, come up with hypotheses, and analyze the results.



Kate Minderhoud is an undergraduate finishing up her Anthropology degree. She is interested in the relationship between environmental activism and public art, and her research with fellow undergraduate Alondra Juaregui is titled “Activism and Spray Paint: Environmental Graffiti in Bogotá Colombia” delves into the embracing of graffiti as legitimate public art.



Nathend Olivares Velazquez is an undergraduate whose project is titled “The Crucial Connection: Exploring the Impact of University Housing on Student Success and Retention.” As a History student, he also minored in European Studies. His research focuses on university housing and how taking part in it impacts residents in more ways than initially thought. It also investigates the connection between living in dorms and student retention, along with revealing the interconnectedness of housing with other aspects of student life.



Angelica Santibanez studies Political Science and Psychology. Her research project, “The Social Pressure First-Generation Students Have with Families to Not Fail,” explores the obstacles first-generation students encounter in pursuing higher education. She joined the Adelante Research Program because she found it incredible that there’s an organization supporting unique research interests.



Mariah Vallejo is an undergraduate majoring in Communication Sciences and Disorders with a minor in Spanish. Her research, titled “The impact of a required office hours assignment on student perceptions of faculty and the academic experience,” ultimately aims to reduce obstacles which may impede students from taking advantage of useful resources on campus.

About Our Student Authors

Graduate Students



Isabel Araujo is a graduate student majoring in Anthropology with a focus on Museum Studies. Her research project, “Making Stewardship First: Community and Collaboration in Collections Management Policy,” emphasizes the importance of collaboration and equity in museum practices. This project centers on a partnership between the Museum of Anthropology and the Office of Tribal Relations to draft a comprehensive collections management policy. The goal is to create a policy that not only facilitates their collaboration but also serves as a model for similar initiatives across the CSU system. Through this research, Araujo aims to contribute to the ongoing dialogue about inclusive practices in museums, ensuring that diverse voices and perspectives are represented in collections management.



Tawny Aerial Bolinas is a graduate student pursuing a Master’s degree in Biological Sciences, with a focus on the intricate relationships between plants and their associated fungi. Her research project, “Pilot Study: Time and Temperature to Eliminate Foliar Fungal Endophytes,” investigates the diverse community of foliar fungal endophytes that inhabit the leaves of plants, specifically *Quercus lobata* (valley oak) from the Big Chico Creek Ecological Reserve. These fungi coexist within the plant leaves without causing visible symptoms and may play significant roles in plant health and stress adaptation. Through this research, Bolinas aims to deepen our understanding of plant-fungal interactions and the impact on ecological processes.



Maggie Farlow is a graduate student in History. Her research project, titled “Unveiling Gender Roles and Identity in Chico’s Founding: Exposing Women’s Leadership in its Prosperity through the Turn-of-the-Twentieth Century,” explores the lives of influential women in Chico, including Annie Bidwell, Ardenia Boydstun Morehead, Emma Wilson, and Ella Gatchell. Focusing on the period from settlement to the early twentieth century, her study illuminates their roles, contributions, and the evolving dynamics of gender within a frontier community. Using a case study approach, she examines their business, social, and familial networks, highlighting their impact as philanthropists, entrepreneurs, educators, and doctors. Their diverse contributions spanned community development, social initiatives, education, and cultural enrichment.



Fernando Infante is a Public Administration Graduate student. His research illuminates the imperative for municipalities to establish robust administrative frameworks to counter black market cannabis activities. By advocating for systems promoting compliance, collaboration, and effective oversight, Infante underscores the necessity of legalizing and intelligently regulating cannabis consumption..



Recamier Jauregui-Ocampo is a Psychological Sciences master's student studying Behavioral Neuroscience. His project titled "Determining the Impact of Adolescent Stress on the Oxytocin System," focused on the interaction between chronic stress and opioid abuse vulnerability in the developing brain. To counter the negative effects of stress and opioid abuse, the team examined the role of endogenous oxytocin in stress and reward related brain regions.



Ashley Dianette Macias is a Social Work graduate student whose research project is titled "The Intersection of Culture, Developmental Stages, and Mental Health Among Mexican American Young Adults in Rural and Urban Communities." Her research study focuses on the challenges faced by children of Mexican immigrants in the United States in forming their cultural identity, which can lead to mental health issues and academic difficulties. Through qualitative interviews with young adults aged 18 to 19, the study aims to explore how cultural loss affects their education, mental health, and family relationships.



Russell McGregor, a first-generation college graduate, completed his bachelor's degree in Political Science Legal Studies and Communications in Public Affairs from Chico State in 2020. He furthered his education by earning a Master of Public Administration in 2023.,



Sonia Quintero is a graduate student in the Master of Public Administration program. With a view to supporting students on campus, her research, titled “Public Sector Accommodation of Neurodivergence,” looks at the present state of neurodivergent accommodation in public settings (both employment and educational), best practices, accommodations desired by neurodivergent employees/students, and the challenges in dissemination and implementation.



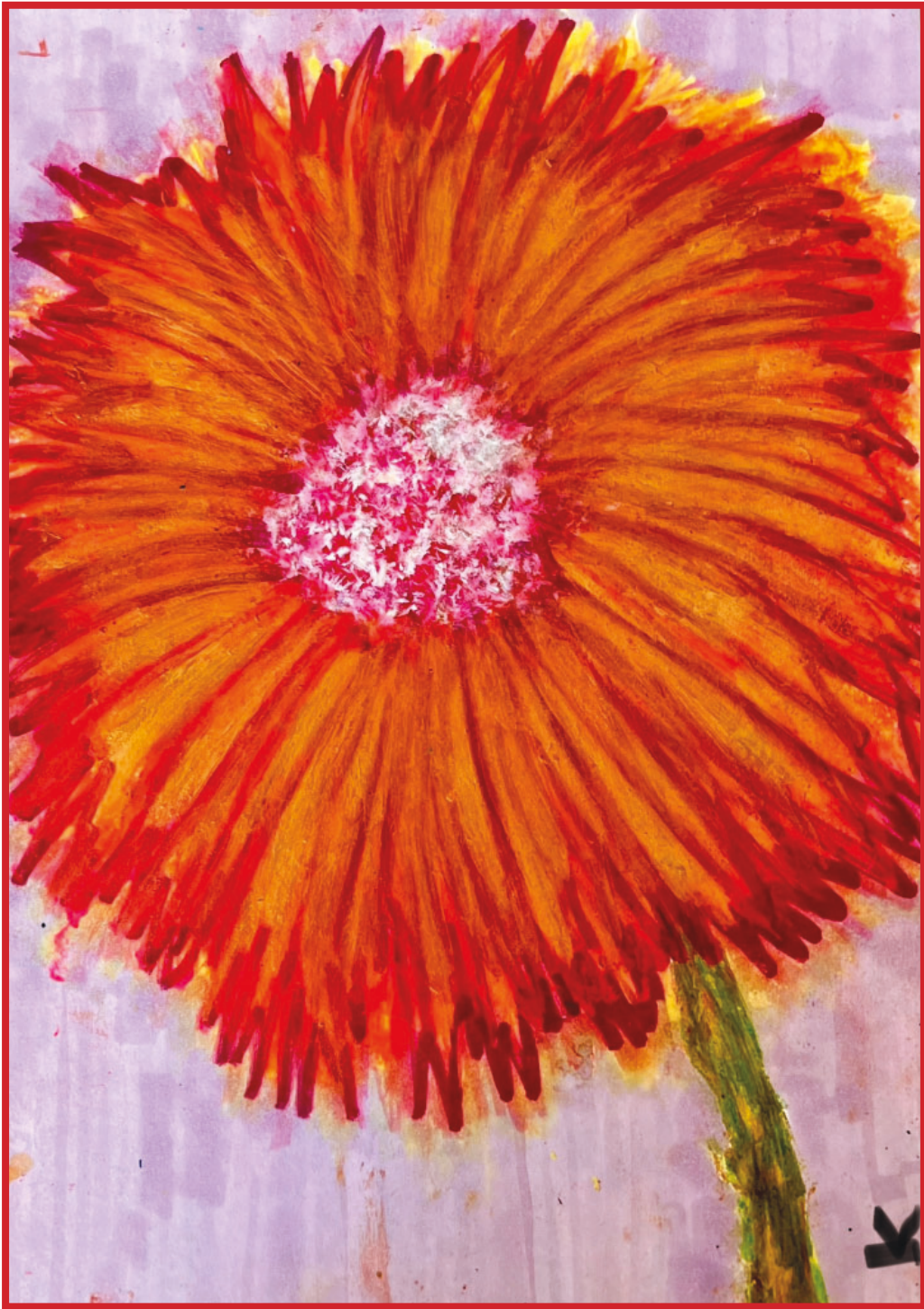
Chris Robinson is a Master of Social Work graduate whose research is titled “Child Welfare Social Worker Retention: The Relationship of Secondary Trauma And Pandemic Stressors.” The study used quantitative surveys of social workers in public welfare agencies and makes recommendations aimed at bolstering institutional and agency supports for social workers experiencing secondary trauma.



Arely Saldana studies Psychological Sciences as a graduate student. Her research is titled “Beliefs about End-of-Life Decisions for Companion Animals.” Her study explores attitudes and beliefs about end-of-life, quality of life, and appropriateness of euthanasia as a means to end the life of companion animals. Plenty of human-animal interaction research focuses on the grief of owners and the emotions of veterinarians after euthanasia, but not on the decision-making and thought processes involved in it. The study aimed to investigate said processes.



Rosario Zepeda is a graduate student in Social whose project is titled Home Share Project: Exploring a Unique Affordable Housing Solution. Her research focuses on home sharing which is a program that is designed to utilize our current housing stock by matching home providers (people with an extra room) with home seekers (those who are seeking affordable housing). Additionally, many home sharing programs are geared towards intergenerational relationships where older adults are able to age in place through the support of home seekers. Home sharing taps into available housing stock and increased support programs for older adults, yet there is a dearth of research on the impact of home sharing programs across the nation. This research aims to fill a gap in knowledge about participants’ experiences in home sharing programs and seeks to understand the experiences of home share participants in Northern California.



FACULTY MENTORS

Meet Our Faculty Mentors



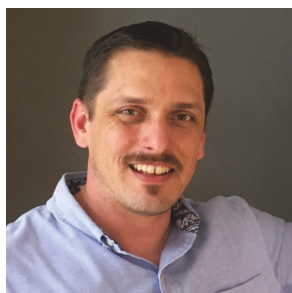
Professor Shawn Bates is an associate professor of psychology and neuroscience at Chico State. His interests include higher learning and research that could potentially benefit individuals suffering from addiction, behavioral neuroscience, adolescence, social environment, stress, and psychopharmacology. Currently, he is using in vivo electrophysiology to examine how stress affects cognition in males and females. His long-term research goals involve exploring long-lasting effects of psychoactive drugs in adolescence, including recreational substances like opioids and psychostimulants, but also those with more clinical relevance, such as ketamine and ADHD drugs like methylphenidate.



Professor Brian Brazeal is a professor of Anthropology and has worked at Chico State since 2007, a position which he took after finishing a PhD at the University of Chicago. Dr. Brazeal's research has focused on anthropology of religion, and visual anthropology, the latter of which has led to him running the Advanced Laboratory for Visual Anthropology.



Professor Molly Calhoun is an Assistant Professor of Social Work. Her research interests include the intersection of race, power, and privilege in housing policy, innovative housing models, the effects of neoliberalism on social work, and rapid rehousing for college students. She primarily teaches social policy, program development, evaluation, and foundational social work practice. Before her Ph.D., She spent over 15 years in community-based practice and was the Executive Director of the University of Denver's Bridge Project. She holds a BA in Psychology from Colorado College, an MSW from the University of Denver, and a Ph.D. in Social Work from the University of Minnesota.



Professor Gerald Manuel Cobián is an assistant professor of biological sciences at Chico State. He is a microbial ecologist interested in plant-fungal interactions. His research interests include plant fungal interactions, biogeography, phylogenetics, and community assembly. His past research has mainly focused on foliar fungal endophytes (fungi that live inside the leaves of plants) and the biogeography of their interactions in an attempt to describe how changing environments influence plant-fungal interactions and explain the assembly processes of fungal communities.



Professor Kristen Gorman is a professor of Biological Sciences with a focus on genetics, cellular biology, and comparative biology. She received her Bachelor of Science from the University of Washington, and her PhD from Simon Fraser University. Her research has focused on developmental correlates to scoliosis; the genetic architecture of scoliosis; cellular characteristics of scoliosis bone cells.



Professor Keiko Goto is originally from Japan. She was born in Gunma Prefecture, which is famous for hot springs and tough women. She holds a bachelor's degree in food science and technology from Kyoto University and a PhD in nutritional sciences from Cornell University. As a nutritionist, Goto has worked in various countries such as Guatemala, Indonesia, Jamaica, the Philippines, and Tanzania, and has developed a deep appreciation of diversity in people and food. Her current research interests include food and culture, international nutrition, and food behaviors.



Professor Shelley R. Hart is an associate professor in the Department of Child Development, a research associate in the Department of Mental Health, Bloomberg School of Public Health at the Johns Hopkins University; and a nationally certified school psychologist. Her scholarship has focused primarily on mood disorders and suicide in school-aged children. Her most recent work focuses on qualitative research regarding the mental health experiences of ethnic minority youth in Butte County. To date, Hart has authored over 50 publications and has over 75 presentations at local, regional, and national conferences.



Professor Kim Jaxon is a professor of English and coordinator of undergraduate research for Undergraduate Education. Her research focuses on literacy, digital literacy, and teacher education. She received her PhD in Language & Literacy, Society & Culture from UC Berkley's Graduate School of Education.



Professor April Kamp-Whittaker is a professor of anthropology. Dr. Kamp-Whittaker is an expert in public archaeology, focusing on WWII Japanese American Internment, the archaeology of inequality and childhood, prehistoric and historic urbanism, and digital anthropology. Her museum studies expertise includes appropriate museology, museum interpretation, digital storytelling, and community collaboration. She leads the Amache Field School in Archaeology and Heritage Management for the University of Denver (DU) Amache Project, integrating public archaeology with museum studies and practical museum training. She received her PhD from Arizona State University



Professor Linda Kline has worked at Chico State since 1990. She received her PhD in environmental psychology from Colorado State University in 1984. Kline actively involves students in research knowing that each project is better with the input and efforts of persons with varied backgrounds and perspectives. Her effort to understand challenges of first generation college students and to take action to remove equity gaps in graduation rates created a perfect connection with her student mentees. Kline is also active in investigating components of human- animal interaction.



Professor Stephen Lewis is a professor of Latin American History and Latin American studies. Hired at Chico State in 1998, he has published on the Mexican Revolution, state and nation building in the state of Chiapas, and the history of Mexican indigenismo.



Professor David McCoy earned his bachelors degree in Communication Sciences and Disorders from the University of Minnesota, his master's degree in Speech Sciences and Audiology at Purdue University, and his PhD in Communication Sciences and Disorders from Florida State University. His current research interests include early intervention, training and education of parents with young children, language and social emotional development, and stuttering.



Professor Eileen M. Morris holds a Bachelor of Arts in Political Science with an option in legal studies and with a minor in Religious Studies, as well as a Master of Arts in Political Science. Since the program's pilot year, she has been serving as a team teacher for the multidisciplinary First-Year Experience U-Course program. She also teaches political science and public administration seminars. She is an alumnus of CSU Chico.



Professor Hadil Mustafa is a professor of Embedded Systems and Computer Architecture. After earning her BA in Chemical Engineering at the University of Jordan, she completed an MA in Electrical and Computer Engineering at California State University, Los Angeles, and a PhD in the same subject at University of California, Irvine.



Professor Sarah Smith is an Associate Professor in the Department of Political Science and Criminal Justice. She has a Ph.D. in Criminology, Law and Society from the University of California, Irvine. She earned a BA in Sociology from the College of William and Mary and a MA in Sociology from George Washington University. Her research focuses on gender, race, and crime. Her work explores alternative approaches to justice, including restorative justice.



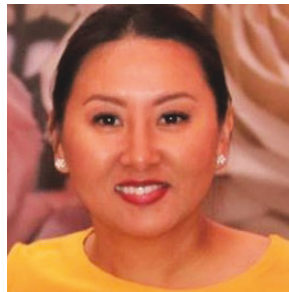
Professor Susan Roll is the associate dean of Graduate Studies and a professor in the School of Social Work. She received her MSW from Arizona State University and her PhD in Social Work from University of Denver. Roll's teaching and research interests focus on poverty and income inequality. She studies how social welfare policies either support or create barriers for families to be financially stable. She also works on how we teach and learn about poverty through innovative pedagogy and experiential learning.



Professor Richard Tillquist is an assistant professor of Computer Science. His work has focused on the behavior of metric dimension on Hamming graphs and on graphs with community structure, on characteristics of truncated metric dimension, and on applications of metric dimension as a tool for generating embeddings of symbolic data for use in downstream machine learning models..



Professor Charles Turner has been a faculty member in the Department of Political Science and Criminal Justice since 2000. Professor Turner earned his PhD in Political Science from Claremont Graduate University. His research and teaching interests include American political institutions (namely the Presidency, Congress, and the Courts) as well as state & local government.



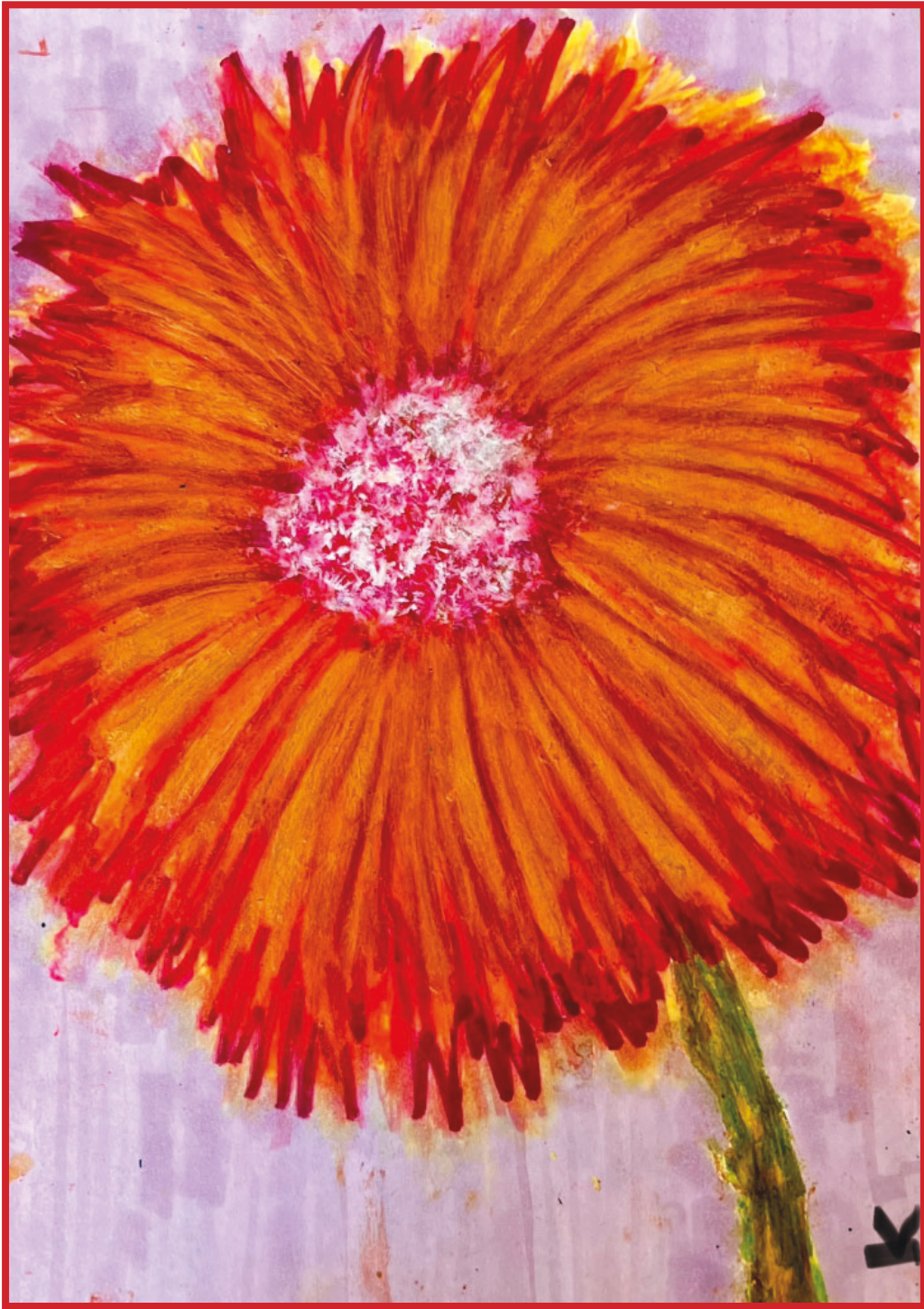
Professor Judy Vang was raised in Oroville and received her bachelor's and master's degrees from Chico State's School of Social Work, and her doctoral degree from Portland State University Graduate School of Social Work. Vang's research interests include mental health, juvenile delinquency, refugee/immigrants, HIV/AIDS, and the educational experiences of students of color. Her past research has included suicide among Hmong Youth, Hmong parents' understanding of the juvenile justice system, HIV, social work education.



Professor Alisa Wade is an assistant professor of history at Chico State and a historian of early America, with a focus on the intersections of the history of gender and capitalism in the eighteenth century. Her research focuses on the intersections of gender history and capitalism in the eighteenth century. Previous projects have analyzed the economic experiences of widows, patterns of women's investing, and the gendered implications of class consolidation in the revolutionary era and early republic.



Professor Lori M. Weber has been a faculty member in the Department of Political Science and Criminal Justice since 1999. Dr. Weber earned her bachelors and master's degrees in Political Science and Economics from Minnesota State University, Mankato and her doctorate in Political Science from University of Colorado at Boulder. Her research and teaching interests include political methodology, civic engagement, food politics, and public opinion and deliberative democratic theory.



APPENDICES

Appendix A

Research & Writing Resource List

Campus Writing & Research Resources

- [Writing Tips – Graduate Studies – Chico State](#)
- [Activities \(Thesis/Project Guidelines\) – Graduate Studies – Chico State](#)
- [Writing Center – Student Learning Center – Chico State](#)
- [Subject Librarians | Meriam Library | Chico State](#)
- [Research Subject Guides | Meriam Library | Chico State](#)
- [ESL Support Services – The Department of English – Chico State](#)
- [BSS Student Success Center – Behavioral & Social Sciences – Chico State](#)
- [Chico State University Communicators Guide](#)

Campus Research Opportunities

- [Student-Faculty Research Collaborative](#)
- [Annual Student Research Symposium](#)
- [Student Awards for Research and Creativity \(SARC\)](#)
- [BSS Future Scholars Program](#)
- [Chico STEM Connections Collaborative \(CSC2\) Undergrad Research Program](#)
- [California Pre-Doctoral Scholars](#)
- [Chancellor's Doctoral Incentive Program \(CDIP\)](#)
- [Funding for Graduate Research and Conferences](#)
- [Graduate Equity Fellowship Program](#)

Websites

- [Style and Grammar Guidelines \(Official APA website\)](#)
- [MLA Style Center \(Official MLA website\)](#)
- [The Online Writing Lab \(OWL\) at Purdue](#)
- [Graduate Writing Overview \(Purdue OWL\)](#)
- [How to Distinguish Between Popular and Scholarly Journals \(UC Santa Cruz\)](#)
- [Writing Tips & Tools \(University of North Carolina at Chapel Hill\)](#)
- [UW-Madison Writer's Handbook \(University of Wisconsin–Madison\)](#)
- [Handouts \(University of Illinois at Springfield\)](#)
- [Common Errors in English \(Washington State University\)](#)

Books

- *The Artful Edit: On the Practice of Editing Yourself* by Susan Bell
- *The Elements of Academic Style: Writing for the Humanities* by Eric Hayot
- *Stylish Academic Writing* by Helen Sword

Appendix B

Submissions



Photo Credit: California State University, Chico

More information is available at the Office of Graduate Studies:
graduatestudies@csuchico.edu.